American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

MARCH 15

1954

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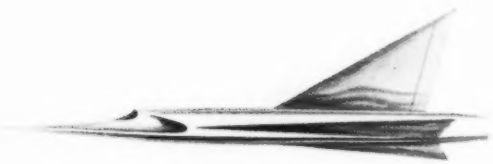

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New British policy of ordering off the drawing boards a number of development models of new aircraft seems to have been first applied to English Electric's F-23 fighter. Without awaiting outcome of prototype's flight trials, 20 more F-23's have been ordered.

Program is designed to cut excessive lead times for new planes—now some three years—which have shown up particularly in the cases of the Hunter and Swift. RAF squadrons still don't reflect the modern types seen at Farnborough.

New "mass ordering" policy might result in the secret supersonic types (including a rocket fighter) now under development reaching RAF squadrons in 1956.

•

Civil-military dispute over Distance Measuring Equipment as part of common system of air navigation is still smouldering. CAA, planning to move ahead with DME, has strong support of National Business Aircraft Association and Aircraft Owners and Pilots Association. ATA is outspokenly critical.

Next word may come from Air Coordinating Committee, rather than Air Navigation Development Board (which is evaluating TACAN). Reason: ACC special working group now looking at common system may eliminate some of the "frills" and, in so doing, make strong recommendations affecting DME-TACAN issue.

•

Canadair won't build the CL-42, corporate version of Beech T-36A trainer. Reason: there'd be few buyers at $550,000 (with spares) price. Prior to reaching decision that plane would be too expensive, Canadair had released details to customers and press.

Still interested in building a business aircraft are North American and Aeronca.

•

Watch for Navy release this week of first official information on vertical take-off aircraft being built by Convair and Lockheed. Convair will shortly ship its vertical riser to Moffett Field for initial tethered tests.

•

U. S. aviation industry's backlog of orders (planes, engines, propellers) totaled $16,798,000,000 on December 31, latest period available. This was down 8% from September 30, 5% from December 31, 1952.

U. S. military orders comprised 93% of aircraft backlog, 97% of engines, 89% of propellers.

•

Boeing has disclosed how financing of its 707 jet transport prototype is being handled.

Treasury Department has given company a memorandum authorizing it to charge construction costs to current expenses instead of amortizing them over a period of years. This means part of the sum will be taken from funds set aside to pay excess profits tax.

Production will be another story. Tooling alone will probably cost $50-60 million; other expenses may push total investment to $80-100 million before first production model is off the line.

The Washington View

Delayed Symington-Bridges Report

Senators Styles Bridges (R., N. H.) and Stuart Symington (D., Mo.) found that you can't hit all the places or see all the people you'd like to in a two-week European inspection tour, but what they saw recently may produce some drastic changes.

From all indications, because the two senators are striving for a bi-partisan effort, the exact nature of their findings will not be revealed until a formal report can be completed. It is estimated that such a report, including recommendations, will be ready about the first of April.

There is a question, however, as to which committee the report will be submitted. Senator Bridges is chairman of the Senate Appropriations Committee and a member of the Armed Services Committee. Senator Symington, former Air Force Secretary, is also a member of the Armed Services Committee.

Colonial in the Spotlight

Colonial Airlines, though admittedly hopelessly subsidized, has reached the big leagues in its merger activities. Top Wall Street financier attention, Cabinet level concern in Government, and even lively interest by President Eisenhower, all have been stimulated by the little carrier's bid to be removed as a taxpayer's burden.

These heights may be topped by future developments. Justice Department officials are still interested in the "unlawful control" activities which resulted in President Eisenhower's disapproval of the original Colonial-Eastern agreement. CAB is interested in the "civil aspects" of such "violations."

But, at press-time, Eastern and Colonial were talking merger again and inside reports were that certain stockholdings in Colonial had been terminated hurriedly. At least the flurry in Colonial stock immediately following the President's action, in which 70,500 shares were traded inside a week, indicates that some changes have been made.

Who'll Head the ANDB?

The selection of a new director of the Air Navigation Development Board, which is the first order of business for the ANDB meeting set up for Friday, March 12, has stirred up the biggest commotion to hit industry technical levels in years.

Two candidates most prominently mentioned, and whom insiders now view as front-runners for the job, are ex-CAA Administrator Charles I. Stanton and S. P. Saint of the Air Transport Association.

However the possibility should not be overlooked of either a "dark horse" candidate (such as United Air Lines' E. A. Post or ANDB's Col. E. C. Wood) walking off with the appointment, or the likelihood of a top industry executive being named.

The Subsidies Pass the House

CAB's fiscal 1955 budget, which for the first time includes a separated airline subsidy appropriation ($40 million plus an estimated $8 million in carryover funds), has been approved in the House, but not without a half-serious fight.

The final action came only after several days of very partisan debate. The Democrats were dishing it out and the Republicans were catching it, no matter which way they turned. Rep. John Rooney (D., N. Y.) was the one who did the most to bait the Republicans and his actions made it eminently clear that an election year is here.

In committee, Rooney reportedly led the way in slashing $50 million in air subsidies and allowing only $23 million out of a requested $73 million. Then when the bill reached the floor he ridiculed the Republicans for their alleged economies. He said the proposed cut was nothing more than deferring payment, because "the law requires that the subsidies be paid."

However, Rooney became equally opposed to a committee amendment to increase the sum from $23 to $40 million.

His change in argument was based on a "legal opinion" that the air carriers have no claim, other than moral, against the government for any promised subsidies that have not been appropriated.

Rooney lost his fight on a record vote of 265 to 105, but was right about the deferral of payment. Should the Senate, which has yet to act, sustain the House action, CAB will have to be back next Spring for deficiency appropriations. The proposed $48 million would only last eight months or until March, 1955, at the Board's present rate of expenditure, $6 million a month.

High-intensity Patent Fight

The government's running fight with the Welsbach Corp., licensee for the high-intensity runway light patent held by Bartow Beacons, Inc., is at last headed for a showdown in the Claims Court. Both sides seem to seek a final decision on the validity of the patent. Government attorneys claim its invalid, but a Texas court has upheld it.

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March 15, 1954

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On the Cover

FREDERICK O. DETWEILER has been elected president of Chance Vought Aircraft, Incorporated, following United Aircraft Corporation's announcement of plans to establish CVA as a wholly owned subsidiary rather than a division of UAC pending achievement of status as an independent corporation sometime during 1954. A native of Granville, Ohio, Detweiler began his aircraft industry career in 1933 as a factory timekeeper for Pratt & Whitney Division, United Aircraft Corporation. He held accounting posts with the division until 1943, when he was transferred to Kansas City as divisional accountant and the assistant secretary of Pratt & Whitney Aircraft Corporation of Missouri. In 1945 he was appointed acting manager of the Missouri plant. In 1946 he became divisional controller for the Sikorsky Aircraft Division, United Aircraft Corporation, Bridgeport, Connecticut. He was appointed assistant general manager of the Chance Vought Division in 1948 and became general manager in January, 1950, directing production of twin-jet Cutlass fighters and attack airplanes (picture on wall) and Regulus guided missiles (model on desk) for the U. S. Navy.

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Director of Advertising: Stephen R. Kent
Circulation Promotion Mgr.: Larry Brettner
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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations, $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA; $14.00 in Canada; $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $150 per year. Managing Editor: Wallace I. Longstreth.

When & Where

Mar. 22-25—Institute of Radio Engineers National Convention, Waldorf Astoria Hotel & Kingsbridge Armory, New York

Mar. 29-31—Aero Medical Assn., 25th annual mtg., Statler Hotel, Washington, D. C.

Apr. 5-8—American Management Assn., 7th National Packaging Exposition, Convention Hall, Atlantic City, N. J.

Apr. 5-9—Air Transport Assn., Chief Pilots Mtg., Dallas Hotel, Dallas, Texas.

Apr. 12-14—Airport Operators Council, 7th Annual Meeting, Tampa, Fla.

Apr. 12-15—Society of Automotive Engineers Aeronautic Meeting, Production Forum & Aircraft Engineering Display, Statler Hotel, New York.

Apr. 19-20—Symposium on automatic production of electronic equipment, sponsored jointly by Stanford Research Institute and USAF, Fairmont Hotel, San Francisco, Calif.

Apr. 21-24—2d Annual Student Paper Competition sponsored by Institute of the Aeronautical Sciences, Texas Section, Adolphus Hotel, Dallas.

Apr. 22-23—Radio Technical Commission for Aeronautics, Franklin Inst. Laboratories Inst. of the Aeronautical Sciences (Philadelphia Section), & Inst. of Radio Engineers (Phila. Section) Joint Meeting, Franklin Institute, Philadelphia.

Apr. 22-23—American Inst. of Electrical Engineers, conference on feedback controls, Claridge Hotel, Atlantic City, N. J.

Apr. 24-25—Air Force Assn., California Wing 7th Annual Convention, Hotel Miramar, Santa Monica, Calif.

April 27-28—Air Traffic Conference, semi-annual meeting, Algiers Hotel, Miami Beach, Fla.

Apr. 27-29—Aviation Lighting Committee, Illuminating Engineering Society technical conference, Milwaukee, Wis. Details from R. J. Stefany, Westinghouse Lamp Div., Bloomfield, N. J.

Apr. 27-30—Air Transport Assn., Purchasing Committee, Clift Hotel, San Francisco

Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia

May 5-7—3d Int'l Aviation Trade Show sponsored by Aircraft Trade Shows Inc., 71st Regimental Armory, New York.

May 6-8—Fourth IAS West Coast Student Conference, Los Angeles.

May 6-8—First Annual IAS West Coast Industry-Faculty Conference, Los Angeles.

May 7-8—National Convention & Air Meet, National Inter-Collegiate Flying Assn., University of Illinois, Champaign-Urbana, Ill.

INTERNATIONAL

Apr. 5-6—Society of Plastics Industry (Canada) Inc., 12th annual conference, Mount Royal Hotel, Montreal.

Apr. 21—ICAO Conference on coordination of air transport in Europe, Strasbourg, France.

Apr. 26-May 8—IATA Technical Conference on Training, Barcelona, Spain.

May 11—ICAO Special Communications mtg., Middle East Region, location to be announced.

May 12-14—Engineering Institute of Canada Annual Meeting, Quebec.

May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.

June 1—ICAO Assembly, 8th session, Montreal.

June 15—ICAO Meteorological Division, 4th session, Montreal.

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Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

REPRINTS

(One of the more pleasant tasks of the business paper is that of filling requests for additional tear sheets or reprints of the articles which have appeared in past issues. We are always willing to make available reprints of stories that have appeared in AMERICAN AVIATION *at cost and, within practical limits, often supply smaller numbers of tear sheets. We thought you might be interested in a typical cross section of recent requests of this nature—The Editor.)*

To the Editor:

We should very much appreciate your sending us two dozen reprints of the article "Red Tape Can Kill Us" which appeared on page 17 of AMERICAN AVIATION for January 4, 1954.

I. R. GOLDSMITH
Assistant to the President
Aviation Engineering Division
Avien-Knickerbocker, Inc.
58-15 Northern Boulevard,
Woodside 77, New York

•

To the Editor:

Your article which appeared on page 52 of the February 1 issue of AMERICAN AVIATION concerning "Variety of Devices Speeds Training" was of extreme interest to our firm.

We would like to purchase approximately 1000 reprints for distribution to our customers and friends.

JOHN H. KOCH
President
Technical Training Aids, Inc.
8106 East Admiral Place
Tulsa, Oklahoma

•

To the Editor:

Kindly forward five reprints of your article "How Convair Forecasts Its Labor Needs" published in the January 4, 1954, issue of AMERICAN AVIATION.

R. E. LORENZ
Supervisor of Estimates
McDonnell Aircraft Corp.
Post Office Box 516,
St. Louis, 3, Missouri.

•

To the Editor:

We wish to thank you for the splendid story published in the January 18 issue of AMERICAN AVIATION covering the Peravia Motograph.

We are wondering if it would be possible to secure additional reprints?

WALTER FINGER
The Matisa Equipment Corp.
224 South Michigan Blvd.
Chicago 4, Illinois

•

To the Editor:

Under contract with the Reinhold Publishing Corp., I am writing a book on the technology of titanium.

In order to point up the advantages to be achieved in using this metal, I should like to include a modified version of the graph "Today's Problem: Weight" which appeared in the article "Problems Multiply in Structures Engineering" published in your October 12, 1953 issue starting on page 38.

May I have your permission to use this figure?

JOHN L. EVERHART
71A Duncan Hill Apts.
Westfield, N. J.

•

To the Editor:

In Looking over your January 18, 1954, issue we ran across the article including the various airline statistics on page 62. Since this type of information is of particular interest to us from an analytical viewpoint, we would like to inquire as to whether you might have such data available for the last five or six years. We are particularly interested in the "Passenger Load Factor" and "Available Ton-Miles Used" figures for U. S. International Airline traffic.

H. P. GILPIN
Production Design Engineer
Lockheed Aircraft Corp.
Georgia Div.
Marietta, Ga.

(AMERICAN AVIATION *has printed these statistics for many years and the information is available for any postwar period.—Ed.)*

•

To the Editor:

Have just read Joe Murphy's article on our Equal Check Inspection Program and want to congratulate you on an excellent piece of work. I don't know how you managed to get all the details that you did in the time spent here.

JOHN CASEY
Director of Standards
and Procedures
American Airlines
Tulsa, Oklahoma

•

To the Editor:

Thanks for the very nice sentiments anent Sabena's helicopter operation "pioneering" in Vandyk's column in the current issue. It will be passed along to all of our top executives in Brussels, and I'm sure they will be most appreciative, too.

STANLEY G. MARKUSEN
Director of Public Relations
SABENA
Belgian Air Lines
422 Madison Ave.
New York 17, N. Y.

•

To the Editor:

We would like to have 500 reprints of your article entitled "Convair Refines the 340," which appeared on Page 30 of your February 1, 1954, edition.

R. JAMES PFEIFFER
Domestic Sales Manager
Consolidated Vultee Aircraft Corp.
San Diego, 12, Calif.

Books

THE SHAPE OF THE AEROPLAN

by James Hay Stevens. 302 pag
Published by Roy Publishers, 25 W
45th Street, New York 19, N. Y. $1

How refreshing it is to find a bo that criticizes as well as praises ai craft. In telling his story of the chan ing shape of aircraft the author, wh is also AMERICAN AVIATION'S Londo technical editor, mentions the good an bad points of almost every major de sign.

This informal history covers U. S and continental European models al most as throughly as those of Steven native land—Britain. Much of the in formation on postwar French aircra has never before been published i book form. The author also manage to put the German effort in the aero natical field into perspective.

It would be correct to term the bo a chatty history of the airplane, sinc the author—engineer, pilot, and avia tion writer—gives the impression tha he is having an off-the-record cha with the reader about a subject tha is very dear to his heart. Certainl there is nothing pompous about hi style and the occasional jokes that h throws in add spice to the story. Par ticularly commendable is his frankne in describing some of the less successf designs in aeronatical history.

The book's value as a historic work is heightened by numerous draw ings by the author himself and an in dex. There will be few who cann learn a great deal from this fascina ing book.

. . . A

SPACE TRAVEL *by Kenneth W. G*

land and Anthony M. Kunesch, pu lished by the Philosophical Libra Inc., 15 East 40th Street, New York 1 N. Y. Price, $4.75. 205 pages.

For the interested as well as th adept, this book traces the history o rockets, propulsive units, and inter planetary travel research from the "fir arrows" of the early Chinese to th ion-drive space ship, built in space.

Generously illustrated with photo graphs and drawings, the pictures do much to clarify some of the more tech nical parts of the text.

The authors doubt the militar value of a space station as a launchin platform for missiles, noting that a les complex machine could be sent up to destroy the station, and furthermore intercontinental missiles could carr war to an enemy more secretly, just a effectively, and much less expensively.

The book is tied in with reports o astronomers, physicists, and astronaut to conclude that a trip to the moon i possible with chemical propellants, bu that interstellar travel will have to wa for better means of propulsion.

. . . WI

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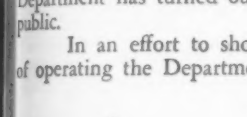
Editorial

The P. O. Economy Hoax

WHAT STARTED out at this time last year to be a hopeful new business administration of the Post Office Department has turned out to be a pompous fraud on the public.

In an effort to show exemplary savings in the cost of operating the Department, Postmaster General Summerfield and his associates are producing a series of tricky bookkeeping maneuvers which in the long run will cost the taxpayers more and will take years to untangle.



But more than that, Mr. Summerfield and associates have gotten into a pointless wrangle with the Civil Aeronautics Board, they have been working contrary to the intent and dictates of the Civil Aeronautics Act of 1938, they have placed the U.S. in a precarious and embarrassing position with its international neighbors, and they have confused the competitive methods of private business with the proper and protective relations which should exist between a government service and public carriers.

To say that Mr. Summerfield has been high-handed is putting it mildly. He has taken unto himself the responsibilities which Congress properly lodged with the Civil Aeronautics Board. He has revealed a large degree of ignorance of public carrier regulation. Most amazing of all, he has become the symbol of retrogression back to the disastrous rate-cutting evils which were considered to have been corrected forever with the passage of the Civil Aeronautics Act of 1938.

It all began last year with the first experiment in having trunk airlines carry first class mail at low rates. The idea was sound and constructive. But the airlines were unprepared for the type of Tenth Avenue bargaining which the Post Office began to use. Just as in the period of 1934-37, the Post Office began dangling the sugar of more mail in front of the airlines before the carriers realized that it was simply the old game of playing one carrier off against another.

That was Step Number One.

Step Number Two is aimed at the hearts of four secondary trunks who were receiving slightly higher mail pay than the major trunks. The Post Office threatened to place mail only on the carriers with the cheapest rates, a move directly contrary to stated government policy.

Step Number Three is the completely nonsensical move by the Post Office Department in a purely selfish action to make its own books look good, of taking U.S. mail off foreign carriers and making the U.S. look somewhat ridiculous to all other countries who have been participating in the international air mail system.

The maneuver was nothing short of a hoax. For every dollar saved by the U.S. Post Office Department itself, the government (or the taxpayers) will lose five dollars. It's perfectly silly, not to say stupid.

Representative Carl Hinshaw, who often before has come to the rescue of civil aviation in Congress, has written to Mr. Summerfield rather sharply reminding the Postmaster General that he is not abiding by the intent and statutes of Congress. He then states:

> "I had thought that the intention of Congress with respect to the making of rates for the transportation of mail by air was reasonably clear. In order to prevent the Post Office Department from using its great volume of traffic to force the rates of the carriers to uneconomic levels, and to force the carriers to transport the mail at a fair price to the government, a quasi-judicial agency was given full power to make the rates which the carriers should charge and the government pay.
>
> "The Civil Aeronautics Board's role in this process is not greatly different from that of a district court which fixes the fair value of a piece of land that the government wishes to condemn. It is not regarded as proper for the government to use extra-legal methods to compel settlement of such a case at a low figure, nor do I think it is proper for the government, in this case, to put such pressures on a carrier that it is forced to petition the Civil Aeronautics Board for a rate reduction. The proper course is clearly spelled out in the statute and should have been followed."

In its comprehensive report to the Air Coordinating Committee recently, TWA brought out the fact that it is not possible to have a regulated industry unless both parties are willing to accept the disadvantages as well as the advantages of regulation.

In answer to Post Office claims that this Department should have the right to negotiate rates for the carriage of mail, apparently drawing on experience in private industry, TWA said that such a plan "overlooks the fact that in private industry there is (1) competition among purchasers and (2) a choice by the producer as to the nature and quantity of the product to be produced. In the case of a public utility there is no such choice. It is obligated to serve."

Mr. Summerfield is far, far off base. He's heading for trouble but worse than that, he's causing a great many needless headaches to CAB and the airlines and eventually to the taxpayer.

Harris and NWA

The resignation of Harold R. Harris as president of Northwest Airlines because of irreconcilable differences of opinion over future policy is not only unfortunate for the company but serves as a symbol of what happens when financial groups who know virtually nothing about running a public carrier obtain dominant control and seek to be management themselves. In his one year as chief executive officer Harris made a highly creditable record. Given the time which any management needs to prove itself, he would have restored Northwest to the position it deserves to have. But the financial junta has decreed otherwise. We can only hope for the best.

. . . WAYNE W. PARRISH

ONLY GILFILLAN HAS PROVEN GAP-FILLER RADAR NOW

IF HOURS WERE MILES

During the entire year of 1953, Gilfillan Surveillance Radar was "on guard" 24 hours a day—8750 hours—at Boston International Airport with only 7⅓ hours of involuntary outage. This is less than 1/10 of 1%! If hours were miles, this would be the equivalent of the short distance from Boston Commons to Boston Airport compared to the vast stretch of air miles lying between Los Angeles, Boston and Moscow.

This example is only one of the many instances of the remarkable 4-year dependability record of *perfected* Gilfillan Surveillance Radar when combined with *outstanding* maintenance by CAA personnel at major U. S. airports.

Reliable air defense requires reliable radar. Gilfillan is the *only* gap-filler radar now available that has already made the long jump from prototype to *proven performance.*

Gilfillan has *developed* and *delivered* more ground surveillance radar than all other manufacturers. The proven dependability of this perfected equipment is *now* demonstrating itself—at this moment and 24 hours every day—at more than 200 air bases and airports around the world.

GCA RADAR AND ELECTRONICS

Gilfillan

LOS ANGELES

GCA

AROUND THE WORLD

Industry Spotlight

• Ryan's recent $7 million contract for a new man-carrying jet calls for development of a vertical take-off fighter for the USAF. Bell, whose VTO craft, also for the USAF, was recently damaged by fire, is the only other firm known to be working on jet-powered VTO fighters. Navy's two VTO fighters, being built by Convair and Lockheed, are turboprop powered.

• Forthcoming order by the USAF for development of a reverse thrust device for quick deceleration of jet fighters and bombers will be placed in about 90 days. Indications are specifications will limit maximum thrust penalty to about 2% in normal operation as compared with about 10% for French design. Boeing, incidentally, will announce a reverse thrust system of its own design next month.

• New high in aircraft engine overhaul periods was recorded recently by Delta-C&S Air Lines with CAA approval for 2000 hours operation of Wright R-3350-BD engines used in its six Constellation L-649A aircraft. Average flight distance for these Connies is 380 miles or 1½ hours; daily utilization of the planes is running 9.4 hours.

• U. S. Air Force will soon place an experimental contract with Harvey Machine Co., Torrance, Calif., for titanium extrusions. Harvey has been doing similar work for Lockheed Aircraft under subcontract.

• Kollsman Instrument Corp. was recently authorized to announce its supersonic machmeter, a 1949 development which has since been used in high speed research aircraft. Instrument has an operating range from Mach 0.7 to 3.0 and most recently recorded USAF's Bell X-1A flight at about 1650 mph.

• Britain's Avro lightweight fighter (9000 pounds) should fly early next year. Its 25-foot span wing has a 65° sweep. It is being considered by NATO, along with the Folland Gnat and France's SNCASE Barouder.

• Maximum speed of the Douglas F4D is Mach 0.951 (715 mph at sea level).

• Highest operating time on a Sikorsky S-55 helicopter has been achieved by New York Airways, which has over 1900 hours on one craft. This is more than double that accumulated by the military services on any S-55 and emphasizes role air carriers can play in accelerated testing of military helicopters.

• Battelle Memorial Institute, Columbus, Ohio, has developed a high-strength, heat-treatable titanium alloy which appears very promising for large scale production. Known as 3% manganese complex, the alloy contains 3% manganese, 1% iron, 1% chromium, 1% molybdenum and 1% vanadium. An optimum strength of 200,000 psi is obtained by heat-treating.

• Production plans for the Sapphire-powered Hawker Hunter have been dropped. All production planes will have Rolls-Royce Avons.

• American Airlines will begin installing Sperry A-12 autopilots in seven long range Douglas DC-7's in the next few weeks. AA ordered the DC-7 with autopilots, but Sperry and Douglas did not have final system details worked out to their satisfaction when the first aircraft were delivered. Plan at American is to operate seven aircraft with autopilots installed, then, if advisable, to equip remaining 18 aircraft.

• Southwest Airmotive Corp., Dallas, Tex., has entered an agreement with the Scintilla Division of Bendix Aviation Corp. to assemble all of the company's quick-disconnect type electrical fittings for users in a nine-state area in that part of the country.

• Contrary to reports in other segments of the aviation trade press, Collins Radio Co. has not abandoned its design of an autopilot without vacuum tubes.

• Powerplant in the Russian MiG-15 now being test flown at Wright-Patterson AFB is definitely a copy of the British Rolls-Royce Nene, but the Reds have upped the thrust rating to nearly 7000 pounds. This places the Russian engine in the same power class with the French Hispano-Suiza Verdon, an improved version of the Rolls-Royce-licensed Tay.

• Hughes Aircraft Co., which is already selling diodes in the commercial market, expects to push forward with development of other non-military products in the field of electronics. Hughes has a computer in an advanced state of development. Program will involve extensive financing, which is reported to have already been arranged.

• Pratt & Whitney Aircraft Division, which has transferred all production on R-1340 engines to its subsidiary, Canadian Pratt & Whitney Co., Ltd., near Montreal, may also transfer all R-985 and R-1830 engine and parts work there later. P&W officials said there are no plans for shifting R-2800 or R-4360 engine production to Canada.

• Details of Britain's Guided Weapons Department's supersonic wind tunnel, which has been operating since June, 1952, have now been revealed by Bristol Aeroplane Co. Speed range is Mach 1.75 to 3.5 in Mach 0.25 steps. Modifications to cover Mach 0.95-1.5 transonic region are under way. Working section is 14.5" wide 20" high.

LINEATOR
is years ahead

Lineator

The Chance-Vought Cutlass was an advanced design in 1947. It is a leader today. The same is true of Airborne's LINEATOR, which was developed for the Cutlass flight control system. Today, seven years later, there is not another "tee" type linear actuator like it.

The same basic model is used in the latest of the Cutlass series, and in the McDonnell Banshee. Modifications of the LINEATOR are specified equipment in the McDonnell Demon; its Air Force companion, F-101; and the Martin P5M patrol bomber.

Conforming to MIL-A-8064 (USAF), the LINEATOR is most adaptable where light weight and short length, for a given stroke, are desirable features. A ball bearing jack screw enables it to handle 1500 lb. maximum operating load in either tension or compression.

Airborne has set the pace in the actuator field with advanced designs like the LINEATOR. As aircraft configurations change and speeds increase, count on Airborne for more of the same. For information on the LINEATOR and other actuators, see our literature in the I.A.S. Catalog.

AIRBORNE
Accessories Corporation
HILLSIDE 5, NEW JERSEY

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

Boeing B-52 to land on strongest high-speed tire yet developed

THE B-52 heavy bomber has a gross weight of over 350,000 pounds. To land it at high speeds, the Air Force needed a tire that could take terrific impact and heat. A tire that greatly exceeds B-52 requirements and could take 50 landings at 200 mph on the dynamometer without failure. It was one of the toughest tests ever set for an airplane tire.

B. F. Goodrich engineers tackled the assignment. Using new techniques and rubber compounds, they came up with the largest capacity high-speed tire yet developed. It not only passed the "50 landings" test but was good for still more. And it passed maximum load-capacity dynamometer tests at low speeds. Cut apart for a post-mortem, it revealed *no sign* of failure. Result: the new BFG high-speed tire won official approval, is now being produced for all B-52's.

In addition, B. F. Goodrich wheels and Expander Tube brakes were chosen as standard equipment.

The development of this new B. F. Goodrich high-speed tire is typical of other BFG engineering accomplishments. The first low-pressure airplane tire—the first high-pressure tire—and the first high-pressure tubeless tire were all B. F. Goodrich developments.

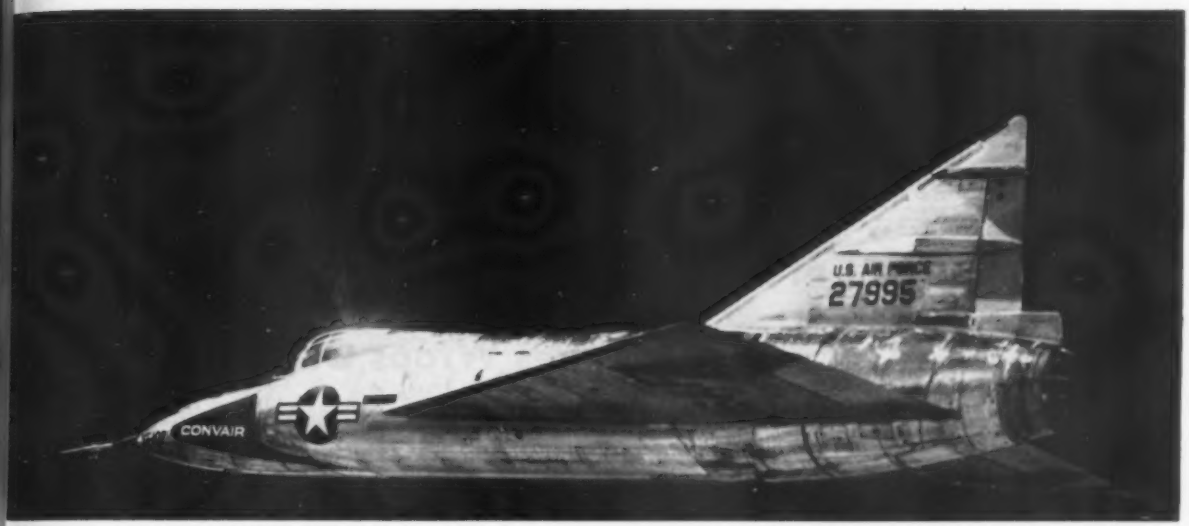
Other B. F. Goodrich products for aviation include wheels and brakes, De-Icers, heated rubber, Pressure Sealing Zippers, Avtrim, inflatable seals, fuel cells, Rivnuts, hose and other accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 17, NO. 21



FLIGHT VIEW of Convair's F-102 shows smaller vertical tail, cockpit set lower.

Supersonic Fighters: 3 Flying, 3 Under Way

Details of Convair's delta-wing F-102 are revealed as Lockhead's F-104 makes first flight.

By WILLIAM D. PERREAULT

THE nation's air-atomic fighter force moved a step closer to reality this month as Lockheed made its first flight in the straight-winged F-104 and the U. S. Air Force released first details on Convair's delta-winged F-102.

These are the second and third aircraft in the USAF's newest batch of supersonic aircraft. Testing and production of the first of this series, the North American F-100, is now moving along at a fast pace.

McDonnell's F-101, a supersonic version of the company's earlier F-88 jet fighter, is slated to fly in the latter half of this year. Neither of Republic Aviation Corp.'s supersonic fighters, the experimental F-103 or the delta-wing F-105, are scheduled for appearance until late 1955 or early 1956. The F-105 is planned for USAF production.

Actually the F-102 made its first flight January 11, but general information on the aircraft, beyond the general knowledge that it was a modified version of the earlier XF-92A delta-wing fighter, was withheld.

It is the USAF's first all-weather supersonic interceptor and is equally significant because it is the first American land-based fighter using the delta-wing configuration. The Convair XF2Y-1 Sea Dart which flew last fall is the Navy's version of the advanced fighter and bears a remarkably close resemblance, considering it is water based.

In its role as a supersonic interceptor the F-102's major armament will reportedly be the Hughes "Falcon" air-to-air missile. Eventually it is scheduled to replace the Northrop F-89 series interceptors as well as Lockheed's F-94C in the Air Defense Command.

TWIN AIR INTAKES on the F-102 have replaced the XF-92's nose intake.

Lockheed's F-104, by contrast, is essentially a new brand of weapon, the USAF's closest equivalent of the stripped-down fighter. It is officially termed a lightweight air superiority fighter, a type designed to provide high speed fire power in a relatively concentrated area. The F-104 is powered by the Wright J65 Sapphire engine, officially rated at 7200 pounds thrust.

The Convair F-102 is powered by Pratt & Whitney's twin-spool J57 engine which also powers the North American F-100. This is a more powerful engine (approximately 10,000 pounds thrust) than the J65, but it is needed to provide comparable performance on the heavier F-102 air-frame.

The F-102 is scheduled to get the even more powerful Wright J67 when it becomes available in production quantities. The J67 is reportedly rated at 15,000 pounds thrust without afterburner, about the same as the J57 rating with afterburner operating.

The flights of these three planes—the F-100, F-102 and F-104— will give the military services the first opportunity to evaluate realistically the claims and counterclaims of each manufacturer in regards to the superiority of his own

particular wing configuration: straight, swept, or delta.

As this is written photos or data on the Lockheed F-104 remain unavailable. First photos of the Convair fighter, however, provide some interesting comparisons when checked against the earlier XF-92, showing areas of design improvement. Most noticeable, of course, is the substitution of the J57 for the Allison J33 (rated at 5200 pounds thrust) in the original plane. This accounts for the appreciable increase in fuselage diameter.

Air Inlet Moved

By moving the engine air inlet from the nose of the aircraft to a bifurcated duct arrangement split on either side of the fuselage, the nose has been left clear for radar and other electronic equipment used in all-weather flight systems.

The landing gear has also been rearranged to take it out of the wing, leaving more space available for fuel and thus providing better range. On the XF-92 the main landing gears retracted outward, burying themselves in the wing. Now they retract inward, with the main wheel assemblies fitting into a fuselage opening. The main strut on the nose gear has been shortened.

There are several prominent changes in the main wing and tail surfaces. The prototype aircraft used a mid-wing configuration, while the production model has the wing well below the fuselage centerline. Removal of the landing gear from the wing may also have permitted a slight reduction in wing thickness.

Vertical Tail Smaller

The size of the vertical tail surface has been cut down appreciably on the F-102, apparently minimizing some of the earlier complaints regarding the excessive size of vertical tail components on delta-wing aircraft. The rudder shape has also been changed, providing a small fixed area above and below the rudder.

Full span aerodynamic fences are used on the F-102 three-quarters of the way out on the wing span.

In keeping with the plane's all-weather role, boot type electrical deicing is provided on the wing and tail.

The changes in fuselage arrangement brought about by the larger engine have made it possible to keep the cockpit within the fuselage area rather providing a protruding bubble, as on the earlier plane. • • •

ADVANCED STATUS of Boeing 707 prototype is shown in this first view of the four-engine jet transport in assembly dock at Boeing's Renton, Washington, plant

Boeing Takes Wraps Off Jet Transport

America's first jet transport, the Boeing 707, has had its four P&W J57 engines fitted and is now almost completed. It should be ready to fly from Renton early in September as scheduled. The 707 design was described and illustrated in an exclusive article in AMERICAN AVIATION of November 23, 1953.

Boeing has confirmed that the 190-000-pound plane is 128 feet long and has a span of 130 feet. It will be capable of carrying 80 to 150 passengers at a cruising speed "in the 500 mph class" and of flying non-stop transcontinentally, as well as from New York to London.

Boeing already has over $15 million invested in the 707. Part of this sum has been taken from funds set aside to pay excess profits tax.

TWO VIEWS of an exact scale model of the Boeing 707 confirm earlier drawings (AMERICAN AVIATION, Nov. 23, 1953) of the 190,000-pound jet transport.

Three Firms Report Income Over $10 Million

Douglas, Consolidated Vultee, and Curtiss-Wright all reported net incomes in excess of $10 million for fiscal 1953.

• **Douglas** netted $18,586,305 or $15.46 a share, on sales on $874,515,463 to November 30, compared with $10,-792,285, or $8.99 a share, on sales of $522,619,409 for fiscal 1952. Backlog: $2.2 billion.

• **Curtiss-Wright** netted $11,402,791 on sales of $438,728,482 for the year ended December 31, compared with $9,-047,514 on sales of $326,183,643 for 1952. Backlog: $865 million at present.

• **Consolidated Vultee** reported a net to November 30 of $10,254,821, or $4.31 a share, on sales of $370,703,232, compared with 1952's net of $10,426,-476, or $4.39 a share, on sales of $390,-997,843. Backlog: More than $1 billion.

Convair-GD Merger Approved by Directors

Directors of both General Dynamics Corp. and Consolidated Vultee Aircraft Corp. have approved a merger of the two firms and stockholders will vote on the proposal April 29. Under the agreement, four-sevenths of a share of GD stock would be exchanged for each Convair share but Convair would retain its name, identity, and personnel.

GD owns 400,000 of the 2,379,298 common shares of Convair outstanding and John Jay Hopkins is board chairman of both companies.

All Douglas Divisions Work on New Models

Each of Douglas Aircraft Co.'s three California divisions is now working on a new military aircraft, the company's annual report reveals.

• **Santa Monica's** engineering effort has been increased with early design work on a new model plane which has reached the stage of evaluation by the military (presumably the turboprop-powered XC-132).

• **Long Beach** is developing an AF cargo plane (presumably the XC-133).

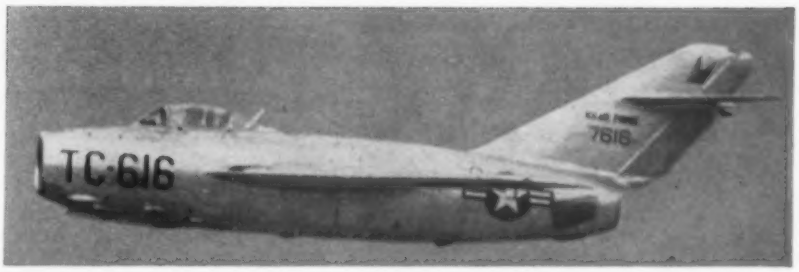
• **El Segundo** is producing a carrier attack plane embodying "stripped-down" principles (presumably the A4D).

Heavy Press Delivery Dates Revealed

Promised delivery dates on nine remaining presses in the USAF's $389 million heavy press program have been obtained from the Air Materiel Command.

Mesta and United have stated they will deliver the 50,000 and 35,000 ton forging presses to Alcoa-Cleveland in July and September, respectively; Loewy has indicated similar forging presses will be turned over to Wyman-Gordon at Worcester, Mass., this coming November and December; the two Loewy 8,000-ton extrusion presses will be completed for Kaiser Aluminum at Halethorpe, Md., in December and in March, 1955; Harvey Machine Co. at Torrance, Calif., will receive its 8,000-ton Loewy extrusion and 12,000-ton Lombard extrusion presses this coming December and January; and Curtiss-Wright at Buffalo will receive its 12,000-ton Loewy extrusion press in December.

A 13,200-ton Schloemann extrusion press is already working at Alcoa's Lafayette, Ind., plant.



First and only flyable Russian-built MiG-15 in the hands of the West is now being evaluated by the USAF's Air Technical Intelligence Center at Wright- Patterson Air Force Base. This is the craft for which the U.S. paid a Korean pilot a $100,000 reward last fall. This model, built late in 1951, still bears some Russian markings and the instruments are said to be copies of U.S., British, and German equipment. The gunsight is reportedly a direct copy of one designed by Sperry Gyroscope Co.

Harris Resigns as President of NWA

The smoldering feud between Harold R. Harris, president and chief executive officer of Northwest Airlines, and the eastern financial group which has taken over dominant control of the airline, came to a climax March 4 with the resignation of Harris and two of his chief aides.

Harris' five-year contract, which has run only since January 1, 1953, was settled for an unknown figure. Willis Player, v.p. of public relations, and H. Don Reynolds, executive assistant to the president, both of whom had left Pan American Airways to join Harris last year, also resigned and were given severance pay.

In a statement issued after the special board meeting in New York, Harris said: "Basic and irreconcilable differences of opinion have developed between myself as president and a group who presently constitute a majority of the company's board of directors. These disagreements, involving reversal of policies previously approved by the board, relate to basic policy underlying the planning for the company's future so that the company may properly discharge its obligation to the public, provide security and expanded opportunity for its employes, and offer a fair return to its owners."

Harris pointed to his solid record of achievement during his year's term and expressed thanks to the 5400 men and women of Northwest "whose loyalty and competence made possible the vastly improved record achieved in 1953."

What's in store for Northwest now is a sharp economy wave to be ordered by the financial group, it is understood. The order for six Lockseed Super Constellations remains undisturbed, however.

The position of Croil Hunter, former president and now board chairman, remains unchanged and he will not resume an active management post. Whether a new president will be chosen soon is not known. Malcolm S. Mackay, executive vice president, continues as chief executive officer.

Fairchild to Buy American Helicopter

Fairchild Engine & Airplane Corp. is about to purchase American Helicopter Co., Manhattan Beach, Calif., and Mesa, Ariz., as part of its diversification program. The rotorcraft firm is now developing small pulse-jet-powered 'copters but also has a design for a craft with a payload equal to 40 passengers.

It is understood that Fairchild plans no management changes after it takes over the helicopter company, and Corwin D. Denny is expected to remain as president of the new Fairchild division.

Maiden flight of the Convair R3Y Tradewind transport. Turboprop engines generate 22,000 hp for the R3Y, first American turboprop seaplane.

Eisenhower Turns Down EAL-CAI Merger

President directs CAB to disapprove move, presumably because of findings of "unlawful" prior control.

By William V. Henzey

COLONIAL AIRLINES' future was very much undecided as this issue went to press, following disapproval by President Eisenhower early this month of its merger agreement with Eastern Air Lines.

The President directed CAB to reverse its original decision and issue a disapproval order on grounds that "mergers must be accomplished in full compliance with the Civil Aeronautics Act, including the requirement for advance approval of any acquisition of control."

This was an obvious reference to original findings by CAB that Eastern had "unlawfully" acquired prior control of Colonial. CAB had condoned the merger because of "obvious public benefits" which, it claimed, outweighed the alleged violations.

The action marked the second setback within two years for Colonial in its efforts to merge its subsidized system into a larger carrier. A previous agreement to merge into National Airlines was defeated by a Colonial stockholders' vote in April, 1952.

Immediately following the President's disapproval, Eastern's President T. F. Armstrong wired Branch T. Dykes, CAI President, renewing the merger offer on the same terms of two shares of EAL stock for three shares of Colonial's.

Also in the picture was National, which had been involved in the Colonial-Eastern case by virtue of a CAB-instituted investigation into a possible Colonial-National merger. G. T. Baker, NAL president, indicated National stands firm on all commitments made by it in the merger case.

A special Colonial board of directors meeting on March 2 indicated that these two possibilities were before it, but failed to produce any statement as to which course Colonial will now pursue.

In addition to the two known merger offers, Colonial could conceivably enter a merger deal with a carrier other than Eastern or National or could try to "go it alone," although it has stated publicly it can't achieve self-sufficiency unless granted some new routes.

CAB's original decision to approve the Eastern-Colonial agreement, despite the "unlawful control" findings, was submitted to the White House on September 14, 1953. Subsequently, the Department of Justice took a stand against the merger in two memoranda, which also were transmitted to the White House.

In December, 1953, the decision was returned to CAB for comment on the Justice position. Last month the Board returned the case to the White House for Presidential action without changing its recommendation.

CAB had originally voted 4-0 (Josh Lee did not take part) in favor of the agreement. Following the disapproval directive from Eisenhower, the Board voted 4-0 for disapproval. In a brief opinion, the agency phrased the President's position this way:

"The President, while taking into account the desirability of suitable mergers among air carriers to strengthen the national air transport system and thereby reduce the subsidy burden, nevertheless concluded that such mergers must be accomplished in full compliance with the Act . . ." • • •

Westinghouse May Sell Conway By-Pass in U. S.

Westinghouse Electric Corp. may shortly bring the Rolls-Royce Conway by-pass engine to the U. S. to try to sell it to U. S. aircraft companies.

The Lester, Pa., and Kansas City engine builder, which has a reciprocal assistance agreement with Rolls-Royce, says performance data on the Conway has been submitted to several American companies and some have shown "considerable interest."

Westinghouse refuses to confirm, however, that a Conway will be imported, declaring only that no military orders for a U. S. version are on hand and none are imminent "from the military."

The Conway is the only large by-pass engine in production by a Western nation at present. Only similar U. S. project, the Packard J49, was shelved in an economy drive in 1949.

ARDC Headquarters Staff Reorganized

An internal reorganization has taken place within Air Research and Development Command headquarters to make its operation somewhat similar to that of an industrial organization.

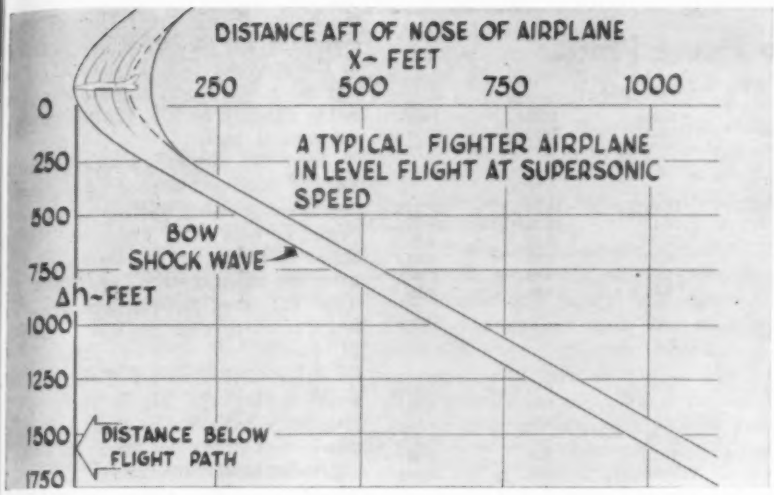
The change is designed to clarify responsibility and authority, fix accountability, and obtain more rapid, efficient, and economical management, according to Lt. Gen. Donald L. Putt, ARDC commander. One of the major changes planned is a gradual shifting of early planning on weapon systems from ARDC centers to ARDC headquarters at Baltimore, Md.

The following positions related directly to ARDC research, development, test, and aircraft programs have been established:

Deputy Commander of Technical Operations will be Brig. Gen. Floyd Wood. The four directorates of his staff include: Research, Col. Don Flickinger; Development, Brig. Gen. Leighton I. Davis; Weapon Systems, Col. Ernest N. Ljunggren; and Operations, Col. Fred W. Miller.

In addition, there will be a guided missile office headed by Col. H. J. Halberstadt and a programming office headed by Lt. Col. W. J. Thomas.

Reporting directly to Putt will be the plans and policies office under Col. Brooks Lawhon, assistant for operational readiness under Col. J. R. Hoxapple, atomic energy office under Col. William D'Ettore, and executive office under Lt. Col. R. G. Moll.



DIRECTIONAL PATTERN of the sonic boom's shock waves is well established.

Sonic Booms May be Used as Weapon

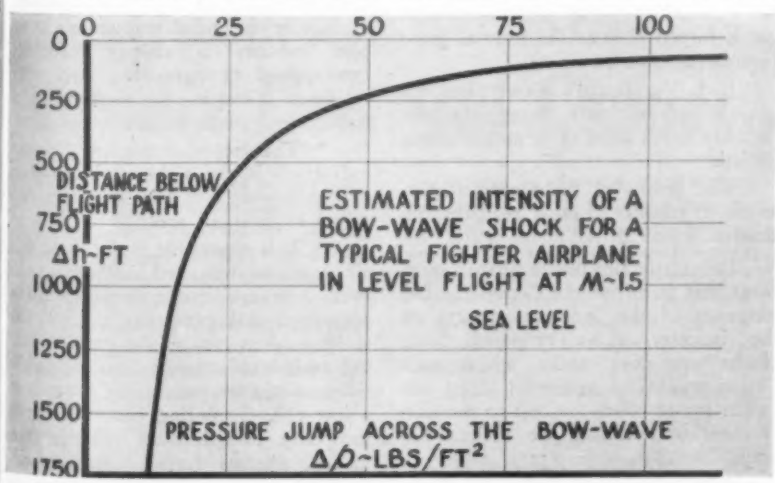
THE ADVENT of the North American F-100 and other military fighters capable of supersonic speeds at low altitude raise the possibility of using the sonic-boom as an offensive weapon, according to Raymond H. Rice, NAA's v.p. and chief engineer.

Talking before the Los Angeles Section of The Institute of the Aeronautical Sciences recently, Rice said shock waves on the order of 50 pounds per square foot can be generated by low flying supersonic aircraft, the equivalent of a 140 mph hurricane force of short duration. To illustrate this point Rice recalled the early flight of the F-100 at Palmdale Airport when quarter-inch thick plate glass windows were shattered, door frames were split, and flying glass thrown in all directions by sonic shock waves.

Investigation has shown that these shock waves are very directional and it is possible to predict pressure and direction of the shock wave. This is illustrated in the accompanying graphs presented by Rice.

Depending on the distance below the flight path, the shock wave pressure varies from about 12 psf at 1750 feet aircraft altitude to 50 psf at about 250 feet in altitude. Rice suggested that this consideration, use of the sonic boom as an offensive weapon, could reduce the logistics problem of storing explosives in the aircraft and permit greater fuel load.

The fact that range could thus be increased, and that low flying aircraft would be under the effective detection altitude of radar, would make it worth designing an aircraft to best utilize this potential. This would call for a plane of Mach 1.2-1.5 speed with as large a cross section as possible. • • •



LOW ALTITUDE supersonic runs assure maximum shock wave pressure.

News Briefs

MANUFACTURING

First electronic missile simulators for Air Force guided missiles are now close to completion; Martin B-61 and Bell B-63 simulators from Link & Bell, respectively, are involved . . . **All-time high** has been reached in employment at Douglas-El Segundo. Total is 23,340 people, some 10% more than WW II record . . . **Annual report of Ryan Aeronautical** reveals that the firm is working on both pilotless and piloted jet aircraft; also revealed are dimensions of the Ryan Firebee . . . **Republic has been awarded an** Air Force contract of $29.8 million, which is described as an interim price for building an unspecified number of F-84F fighters.

Lockheed has begun moving into its new military Constellation final assembly hangar at the Lockheed Air Terminal at Burbank, adding 190,000 square feet to the California Division . . . **Part of that company's** experimental engineering flight work has also been moved from Edwards Air Force Base to Palmdale . . . **According to an article in Fortune** magazine Wall Street will be surprised if Glenn L. Martin Company's debt is not revealed as being halved in the firm's next financial report . . . **Cannon Electric Co. of Los Angeles** has set up a company in Great Britain, to be known as Cannon Electric Co., Ltd.

AIRLINES

A program for operation of a Panagra Douglas DC-6B with Bendix 3.2 cm airborne weather radar has begun. The unit will be used on scheduled operations between Miami and Buenos Aires . . . **Air France Comet II** fleet will be furnished with 16 integrated flight systems by Collins Radio Co. . . . **Transports will be forced down** over Saudi Arabia by that government if they have landed at Israeli-controlled airfields, according to a recent warning. Transports would also be held liable to confiscation and "other penalties" . . . **A revised staffing plan** for the Bureau of Safety Investigation of the CAB has been approved by the Board. Eleven positions will be cut and the field organization will be reshaped . . . **TWA has received** an 80% five-year certificate of necessity of $46 million covering the purchase of 20 Lockheed L-1049's and spares . . . **Questions about the handling** of French in-transit passengers at Idlewild have been raised by a Gaullist deputy, who wants to know whether the French government is aware that such passengers are queried about their political activities in France.

Three Ways to Figure Profit

(Before interest but after income tax)

	1952	1950–1952	1948–1952	1946–1952
PROFIT MARGIN ON GROSS REVENUES [1]				
Electric Utilities	19.22%	18.94%	18.92%	19.27%
Natural Gas	15.01	16.13	16.38	16.57
Class I Railways	10.82	10.70	10.33	9.97
Motor Carriers—Passenger	5.96	6.28	6.48	7.83
Air Carriers [2]	6.00	6.01	4.73	3.24
Motor Carriers—Property	2.59	3.06	3.42	3.35
PROFIT AS PERCENTAGE OF INVESTMENT [1]				
Electric Utilities	5.92%	5.83%	5.87%	5.93%
Natural Gas	5.91	6.29	6.36	6.53
Class I Railways	4.17	4.02	3.79	3.53
Motor Carriers—Passenger	12.18	11.59	11.26	14.29
Air Carriers [2]	10.86	10.25	7.99	5.43
Motor Carriers—Property	12.05	14.36	16.33	16.06
TIMES INVESTMENT TURNED OVER PER YEAR [1]				
Electric Utilities	0.31%	0.31%	0.31%	0.31%
Natural Gas	0.39	0.39	0.39	0.39
Class I Railways	0.39	0.38	0.37	0.35
Motor Carriers—Passenger	2.05	1.85	1.74	1.82
Air Carriers [2]	1.81	1.70	1.69	1.67
Motor Carriers—Property	4.68	4.69	4.77	4.80

[1] *Industries are arranged in order of size of profit margin.*
[2] *Total industry data are used because of difficulty in separating investment between domestic and international operations for all the periods.*

The Board's New Look at Profits

Long term planning is emphasized in current approach to airline earnings; variety of factors weighed.

By William V. Henzey

OUT of the uncertainty engendered by Congressional investigations, adverse court decisions, and general criticism of the Civil Aeronautics Board recently emerged a statement of position by the Board that could do more to achieve stability for the U.S. airline industry than any previous action in the agency's 16-year history.

At least it assures first-time government recognition of the severe economic fluctuations to which the air industry is susceptible and, in that, should inspire confidence in industry management that has been lacking during the up and down years since the government assumed regulatory control.

In short it sets up the "profit pattern" as a key to the air industry's financial picture to be viewed along with the stability in the demand for the product of air transportation. Thus the industry may get away from the "rate of return on investments" as the only measure of an airline's success, or lack of it.

The profit pattern consists of an evaluation of these three major aspects of the industry's financial status in comparison with other regulated industries:

• **Profit Margin:** The percentage of profit compared to gross revenue.

• **Return on Investment:** The percentage of profit compared to total invested capital;

• **Investment Turn-Over:** The number of times per year the invested capital is turned over or the ratio of gross revenue to invested capital.

It is the Board's view, after application of this new theory, that the industry needs stability to attract sound capital.

The results of the theory applied to air in relation to other regulated industries appear in the above chart.

Immediate aim of the Board's statement was to advise the Commerce Department of the "adverse impact" on the industry of a proposed "user charge" program under which each airline would be assessed a 2½¢ per gallon tax to offset the cost to the government of operating the Federal airways.

Apparently it was successful in its immediate aim, because a revised and much less drastic "user charge" stu eventually was forwarded by Commer to Congress for consideration. That r sult alone was worth about $36 milli to the industry, or 50% of the industr net annual profit.

But the long-range aspects of t Board's statement are of equal, if n greater, importance to the industry, pa ticularly with the awesome burde ahead of attracting sufficient capital t meet the changeover to jet equipmen That imminent re-equipment progra is expected to cost the industry abo $1 billion.

That CAB is aware of the need f strengthening the air industry on a long-range basis can be seen from the conclusions drawn by the agency in i statement to Commerce:

• **"From the nature** of its prof pattern and the stability in the dema for its product, the financial security o air transportation is weak in compar son with other regulated industries.

• **"Unless capital requirements** ca be met on a private enterprise basi substantial additional financial assis ance to the industry will be required i the U.S. position of world leadership i air transportation is to be protected

• **"While the per cent of profit** t investment is probably the best measur of the magnitude of profit actuall earned by a company in any given yea or period, the "profit margin" is a more reliable indicator of the inherent risk from recurrent economic fluctua tions of the magnitude common to air transportation.

• **"An industry which is subject** to serious and sudden fluctuations in earning power and which also has a thin profit margin will be classified in the financial market as a speculative industry rather than an industry of stabilized earning power.

• **"With such a weak showing** during the period of its peak growth, it must be concluded that the air transport industry is already materially handicapped in competing with other regulated industries for capital even if no user charges at all are imposed.

• **"The fact** that the air transport industry is in the highest price position of all transport industries further undermines its financial security.

• **"It is reasonable to conclude** that air transportation will experience its greatest competitive advantage during periods of peak prosperity and will fall to its weakest competitive position during periods of adverse business conditions when mass purchasing power is at a low ebb. Or during periods of peak prosperity, time is more valuable than money, whereas during periods of adverse business conditions, money is more valuable than time.

"It becomes of utmost importance to view the earning power of air transportation, and therefore its capability to absorb, in terms of its long-range rather than its short-range profit position."

That is a nut-shell view of the agency's new analysis of airline economics. Operations Bureau Director Joseph H. FitzGerald emphasizes that it is not designed as a picture of gloom for industry financiers and operators, but rather the contrary. If the regulatory agency responsible in large part for the industry's health is aware of the economic characteristics of that industry, the future should be brighter. At least it can be tackled with more confidence.

In the past, partcularly in mail rate and passenger fare matters, CAB has been criticized for taking a "key-hole" view of the industry financial picture.

The Board's statement was forwarded to Commerce Secretary Sinclair Weeks last November under covering letter from then-CAB Chairman Oswald Ryan. It had been prepared largely under the direction of FitzGerald and Warner Hord, chief of the office of carrier accounts and statistics. It was originally submitted to Weeks on an "unofficial" basis, but its release to the industry generally was voted by the Board Members this month.

Of particular significance is that CAB, after studying the "profit pattern" of air transportation in relation to other industries, views the "profit margin" as a more accurate index of just how the airlines are doing financially. Also, the Board now sees that application of any yardstick must be on the long-range and not the short-range profit picture.

For example, despite a rate of return on investment almost twice that of electric and natural gas utilities in 1952, the airlines made less than six cents profit out of each dollar of revenue, as compared to 15¢ to 20¢ for the other industries. When the long-range view is taken, the airlines averaged only three cents out of each revenue dollar over a seven-year period, while the electric and gas utilities maintained their 15¢-to-20¢ average.

Thus it is that the government now appears to be looking at the air transport industry in its proper perspective. That could constitute a two-pronged advantage for the airlines. It means that money won't be taken away through enforced rate cuts not otherwise deemed reasonable, and it means that the industry will be looked upon in financial circles as a more stable utility worthy of new capital to meet the jet challenge of the near future. • • •

Hinshaw Attacks Govt. Rate Cutting Efforts

Rep. Carl Hinshaw (R., Calif.) has severely criticized the Federal Government for taking advantage of its position as the "world's largest single buyer of transportation" to force lower charges from private carriers.

Addressing the Aero Club of Washington last month, Hinshaw renewed his attack on the Post Office Department for alleged "pressure tactics" in gaining lower air mail transportation charges and broadened his criticism of recent governmental agency actions to include the Defense Department.

Hinshaw recalled the many battles which were fought over the years to develop a sound air transport system and decried the failure of those newly arrived in Washington to take cognizance of those historical facts. It is unfortunate, Hinshaw said, that the "new faces, new people not necessarily familiar with that background, who don't know the antecedents" are now in government throwing the Government's "weight" around.

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Interview

with

Harlan D. Fowler

Inventor of the Fowler Flap

• • •

1954—Big Year for Boundary Layer Control

• • •

Harlan D. Fowler, a consultant on boundary layer control, has been actively engaged in research, development, and design of aircraft since 1917, serving with Fokker, The Glenn L. Martin Co., Convair, Douglas Aircraft Co., Fowler Aircraft Co., the Bureau of Aeronautics, and the U.S. Air Force.

His Fowler Flap design, one of more than a dozen patents issued in his name, has become synonymous with high-lift wing design and is used on more than three dozen aircraft, including the Boeing B-52, B-47, and C-97; the Convair Liner and B-24; and Lockheed's P2V, Constellation, and Lodestar. It has also been used by the French, the British, and even the Russians in such planes as the MiG-15, Il-38 and Tupolev 200 (without his permisison).

There is every indication that this will be the year of decision for boundary layer control, climaxing decades of dreams and designs. Rapid developments in this field during the past five years, shrouded by military secrecy, have brought BLC to a stage where a number of experimental installations in transports, helicopters, and even fighters are likely during the coming months.

In the accompanying interview with Harlan Fowler AMERICAN AVIATION brings you an expert's views on the principles, problems, and potential of this aerodynamic development.

Q. What is the future of boundary layer control?

A. I believe we will see the day when it, in all aspects, becomes a generally accepted means of increasing airplane lift, decreasing profile drag, and improving stability.

Q. How do you define boundary layer control (BLC)?

A. In the modern sense BLC is the utilization of mechanical means to create suction or blowing to maintain smooth, or "laminar," flow of the boundary layer of air over the surfaces of a wing, fuselage and tail. When laminar flow breaks down the boundary layer separates from the surface and the flow becomes turbulent. This destroys maximum lift, increases drag, and causes erratic pressure distribution.

Q. Is BLC a new discovery?

A. No. It has been the subject of theoretical studies and experiments since Prandtl's first exposition in 1904. Research was first made by the Germans on the effect of suction on maximum lift as far back as 1928. It was first put to practical flight tests on the Goettingen AF-1 and AF-2 airplanes during 1939-42. The AF-2 attained a maximum lift coefficient of 3.8 for a suction coefficient of .031 with power off. There was sufficient data to indicate that with power on the maximum lift coefficient would have exceeded 5.0, which is exceedingly high for a single engine design.

Q. Were the Germans very far advanced in this field when the war ended?

A. Very much so. They had developed to the prototype stage the Arado 232A, the Junker Ju-90, and the Dornier DO-24, which used a combination of suction and blowing over the flaps to increase the lift. Considerable development was also under way with the Messerschmitt Me-109G, which used the all-blowing method. Other German airplanes in the design stages were the Bloom-Voss, Arado 234, etc.

Q. In regard to the Arado 232A, did this airplane fly with BLC in operation?

A. Although it was flown, the BLC system was not placed in operation because the German Air Ministry would not grant it a high enough priority to use the hydrogen-peroxide ingredients which were used for fuel in the Walther engine, then being experimented with on rocket driven aircraft. The same situation existed with the Ju-90, which was also flown but without BLC in operation.

Q. Has any work been done since the end of the war on airplanes using BLC for high lift?

A. Prior to 1950 several small airplanes were developed and tested but the results have been disappointing, principally due to the inadequacy of the power source and to lack of technical knowledge as to the best method of maintaining laminar flow over the wing and flaps.

Since 1950 considerable effort has been put in on a BLC-equipped Cessna 190, but since the performance results have high security classification no data can be revealed.

Q. The development of such high lift by means of BLC usually has a serious effect on longitudinal controllability. What is the answer to this?

A. The AF-2 was fitted with an all-movable horizontal tail, in which the stabilizer deflected at the rate

'Reduce the take-off and landing distance by 50%'

three-fourths that of the elevator. Throughout the entire flight range, with BLC in operation, both with and without power, an elevator range of ± 10° was ample even though the tail design did not have a high volume capacity.

With a large tail surface area it may be possible to develop sufficient control with only the elevator. This will depend entirely on the effectiveness of the downwash and the amount of retardation of the airstream velocity over the tail surface caused by the highly deflected flap position, sometimes approaching 55° with BLC in operation. Tightly sealed elevator hinges would improve this by preventing losses in lift.

However if very high lift is to be attainable, over the figures quoted, it may be necessary to apply a blowing BLC system to the tail surface, and in this way increase the lift sufficiently to overcome high pitching moments and loss of air velocity over the tail.

Q. How does lateral control function with BLC?

A. Usually by blowing BLC air over the ailerons, which are drooped sufficiently to maintain high lift over the wing tip, and thus prevent tip stall. This was the method used in the Arado 232A. In this condition lateral control is very good. Because drooping the ailerons adds complication to the control system mechanism, it may prove more beneficial and less complicated to introduce spoiler control and use full-span flaps.

Q. Do you see any advantages in using BLC on large aircraft?

A. On large transports with wing loadings from 40 to 100 pounds per square foot the problem of getting them to take off and land on present runways is becoming more and more acute. There is a limit to airport expansion to meet the ever increasing demand for longer runways. The situation is further being complicated by crowded schedules and the stacking up of transports waiting for a space to land.

By means of BLC it will be possible to reduce the take-off and landing distance by 50% or more and thereby permit at least two or three transports to land on the same runway at the same time. When jet powered transports become common our best airports will be unable to accommodate them unless some such means as BLC is used. I believe that CAA will permit this practice when BLC operation becomes efficient and dependable and such aircraft are fitted with full-span flaps.

Q. What do you consider to be the most pressing need for research and development to make BLC for high lift a success?

A. We have just about explored all possible aerodynamic factors in the design of an efficient BLC system, but there still remain the mechanical problems involving new power sources.

Bleeding off from turbojet engines is one of them, provided it is not excessive. The ducted-fan jet engine is another promising power source. The use of powerful compressor engines remains to be explored, and hydraulic pumps and even ethylene-oxide combustion used to operate fans have feasible applications.

Atomic power is another possibility, and may offer the most promising power source so far suggested.

The essential thing is to be able to supply large quantities of air under adequate pressure to maintain laminar flow over the wing and flaps under all angles of attack. Flow requirements may vary from 200 to 2000 cu. ft. per second, depending on the size of the aircraft, for periods up to 30 seconds during the entire take-off and landing period. These are stiff requirements.

In addition, size, weight, and powerplants must be kept within reasonable values. Space is probably the most critical factor because there remains so little space in modern aircraft available for such purposes.

Reduces Profile Drag

Q. You mentioned that BLC can have beneficial effects in reducing the profile drag. How is this done?

A. When the boundary layer of air becomes turbulent the friction or profile drag increases. The theory behind the design of low-drag airfoils is the prevention of early separation of the laminar flow so that it will adhere to the surface as far aft of the leading edge as possible. But even with these airfoils separation still occurs too near the leading edge.

By means of continuance or area-suction BLC it is possible to retain nearly 100% laminar flow and an attendent profile drag reduction approaching one-quarter that of the low-drag airfoil. Drag reductions of this order have been obtained in highly specialized wind tunnel research by NACA.

Area suction is done through a porous surface, such as sintered bronze or steel, discreet slots, or perforation. It sucks off the stagnant or low velocity boundary layer of air adjacent to the surface. In removing this low velocity flow the thickness of the boundary layer becomes thinner and the flow accelerated. Suction must be continuous from the leading edge to the trailing edge in order to counter the tendency towards increasing thickness of the boundary layer as it approaches the trailing edge. This leads to separation, turbulence, and drag.

Q. What kind of porosity appears to be the most practical?

A. From the standpoint of controlled suction flow in feet per second and for low pressure requirements, it now appears that perforated sheet is the most practical. The NACA has proved by extensive tests that there is less tendency to clog perforated sheet with dust or rain and it requires less attention than the sintered material or discreet slots.

But all these methods of porosity have a profound effect on the design of the wing or fuselage, because of decreased strength, difficulty of maintaining glassy smooth surfaces, and the most difficult of all, retaining hermetically sealed ducts to convey the sucked-off air to the suction pump.

Q. What is the significance of using BLC to reduce drag?

A. When applied to the wing of a large transport it may be possible to increase the range as much as 25% and if applied to the entire airplane it may increase the range 50%. But for the same initial range it would be possible to increase the payload according to the reduction of required fuel load and thereby greatly improve the economical operation of a transport.

Q. What are the criteria that must be met to ensure an efficient form of area suction BLC?

A. Since the perforated surface appears to be the

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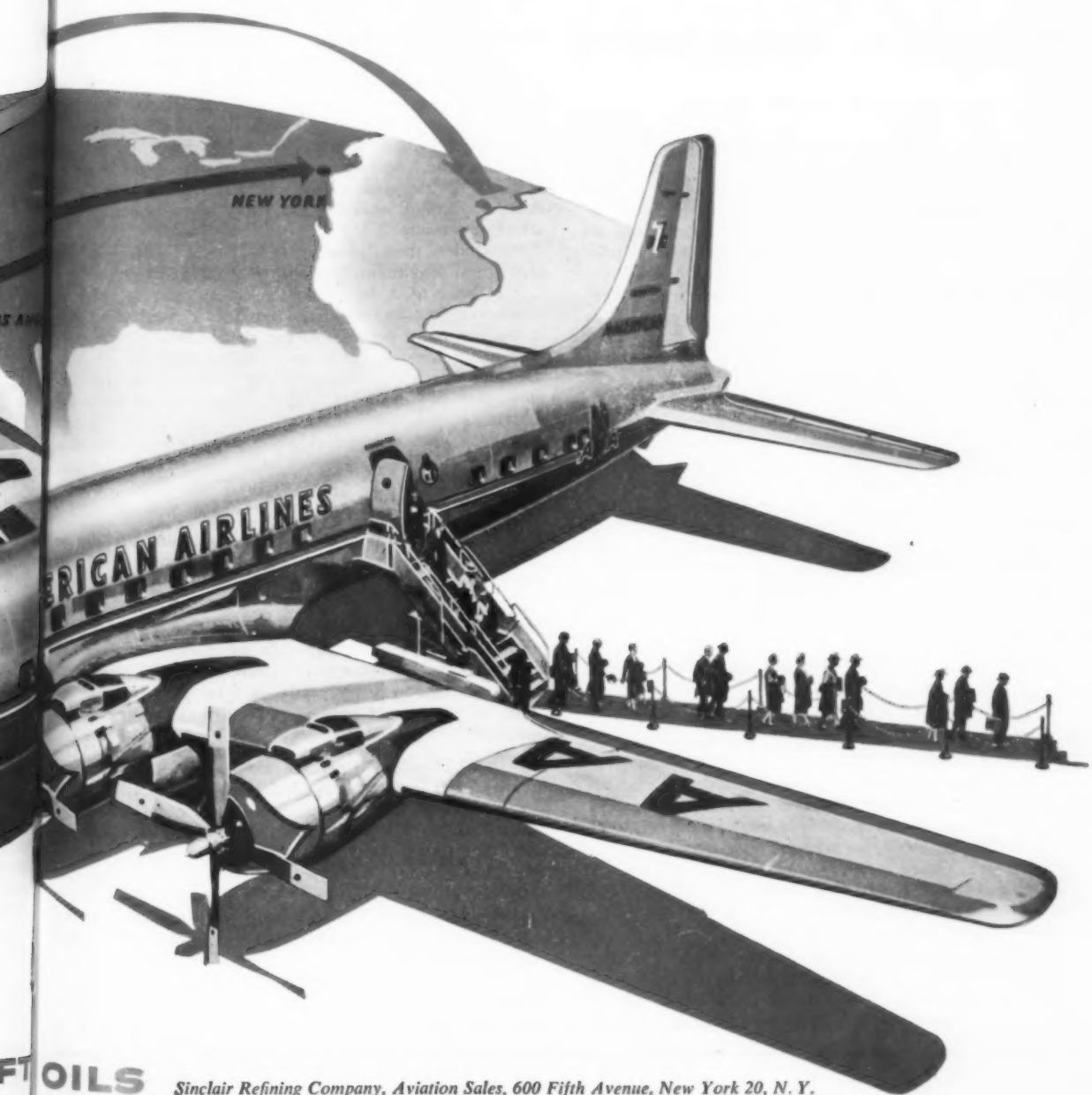

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best form of porosity for area suction, it is necessary to locate a series of small holes of specified area in the forward portion of the wing, both upper and lower surfaces. As the maximum section of the airfoil is passed the holes must be made larger or increased in number to suck off the greater thickness of the boundary layer. An even larger suction area is needed as the trailing edge is approached.

The flow through the surface must be carefully regulated by interposing some form of porous material under the perforated sheet such as felt, filter paper, etc. The velocity through the surface may be from one to two per cent of the free air velocity, which is extremely low. The Reynolds Number of the boundary layer displacement thickness Rδ should not exceed about 4000 between a series of spanwise perforated holes spaced chordwise.

The surfaces must be glassy smooth and free of waviness. Vibration caused by rough operation of propellers and engines can have a very disturbing influence.

How Transport Would Operate

Q. How would a transport equipped with area suction BLC operate?

A. The best altitude for operating BLC to control properly the suction flow appears to be from 30,000 to 50,000 feet and at the cruising speed now commonly attained with turbojet aircraft, or about 500 mph. Under these conditions the density is extremely low and the kinetic viscosity so high that surface waviness or even roughness will not be as detrimental as has been experienced in wind-tunnel tests.

Q. Will the same problem exist for power sources as pointed out under BLC for high lift?

A. Yes, but the source need not be so powerful with respect to cubic feet of air to be removed. A bleed-off from the turbojet engine would probably be ample as a power source, but much remains to be done to develop a pressure-suction pump that can operate at such high altitudes. Because it must operate continuously throughout the flight, the pump must be capable of functioning under low density air conditions, and be able to adjust itself to varying suction quantities, such as may be caused by snow or rain obstructing the surface through which the air is being drawn.

Q. Do you believe it will be practical to design a wing to incorporate area suction BLC?

A. If the trend persists towards thick skin with integral spanwise ribs, multiple spars and ribs, it will be an extremely expensive development to carry through.

It is my belief that a form of glove will be developed which can be easily applied or removed from the wing. Such a glove can be lightly constructed, made to the desired airfoil shape, and permit area suction all the way from the leading edge to the trailing edge without interference from internal construction such as spars and ribs. It will permit ease of maintenance at low cost, without impairment of the basic wing.

The glove would include the perforated skin and ducts, and would cover the entire wing and fit as tight as a glove on both sides. This form of glove would greatly facilitate experimentation with production type aircraft, and eventually be incorporated as standard equipment for operations best suited for this purpose.

Leakage of ducts poses a very serious problem of maintenance, because leaking ducts would permit outward flow and this has a marked effect in increasing the drag above that of the basic wing.

Q. Do you foresee any difficulty in transmitting the aerodynamic loads from the glove into the basic wing structure?

A. While this is not a simple matter a practical method of accomplishing it has been designed. Patent papers are now being drawn up on the specifics of this design which would make it possible to adopt advanced boundary layer control systems to aircraft now in production or even to those in operation.

Q. You also mentioned that BLC would be beneficial in improving stability of aircraft. How?

A. It has long been known that nose slats have a very stabilizing effect in preventing stall below the commonly accepted maximum angle of attack. With the advent of sweptback wings with thin sections having a sharp nose contour the stall angle of attack is seriously affected, thus resulting in very low lift. This in turn causes a reverse shift of the pitching moment, which induces a pitch-up tendency and rearward movement of the center of pressure.

Under these circumstances lateral control is impaired and longitudinal stability is greatly affected.

The NACA has done some very valuable work in developing area suction at the extreme leading edge, within the first three per cent of the chord. Area suction tends to prolong the lift curve to a larger angle of attack in the same manner as the nose slat, resulting in great improvement of maximum lift, reduction of pitch-up, and substantial reduction of drag. The installation of area suction to a wing is far more simple and less costly than the conventional nose slat, and when not in operation does not cause the large drag commonly associated with the retracted nose slat.

Q. Cannot this increase in maximum lift also be used to develop even higher lift obtained with BLC over the flap?

A. It certainly can. However, if the angle of attack becomes too great, such as beyond 20°, it will not be possible to take full advantage of it for take-off and landing purposes. Nevertheless there are some wing configurations that will stall early in spite of BLC over the flaps, in which case area suction at the leading edge is beneficial.

Q. Then it is possible to develop BLC that will improve high lift, low drag, and good stability all at once?

A. To a certain extent, yes. It is quite conceivable that a common power source will be used for all these purposes, but under alternate performance requirements.

For instance, BLC may be applied to the flaps and nose portion simultaneously to improve take-off. When the airplane reaches its designed cruising altitude this could be redirected to reduce the drag by area suction over the entire wing.

In this way the weight of the power source can be absorbed into the entire BLC system rather than for a single purpose. • • •

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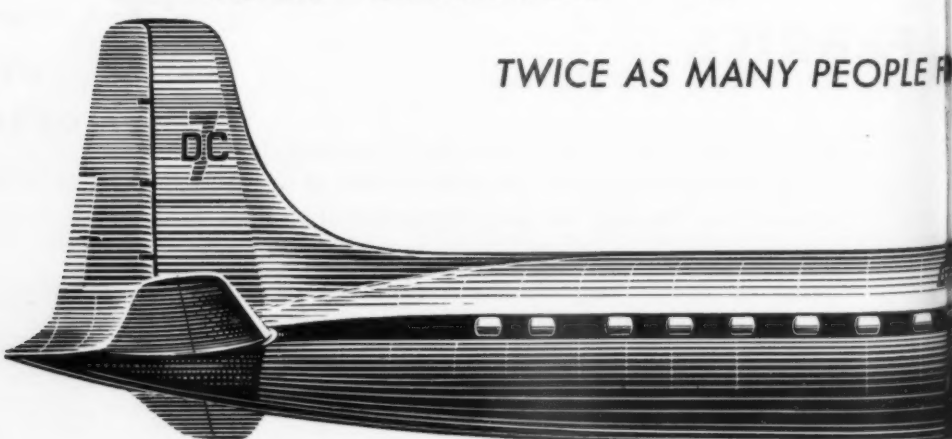

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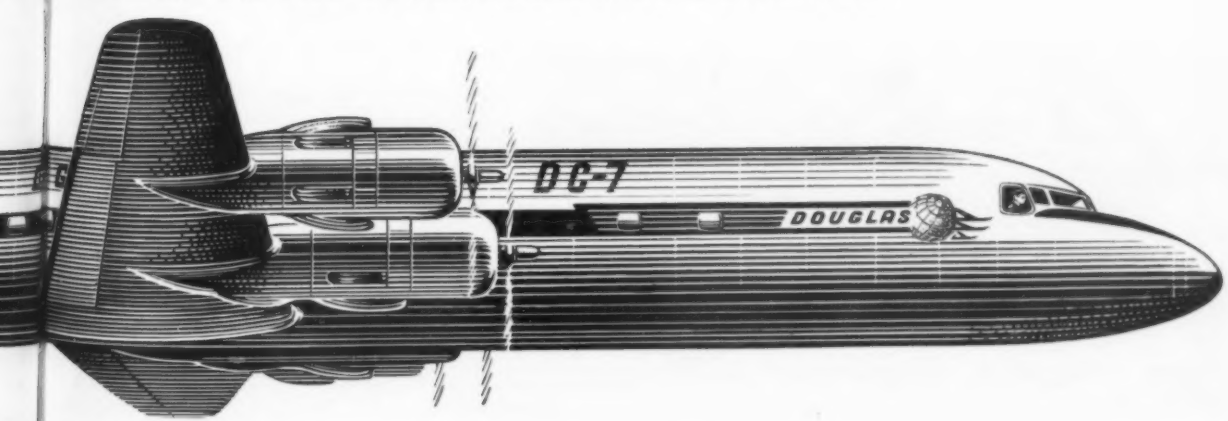

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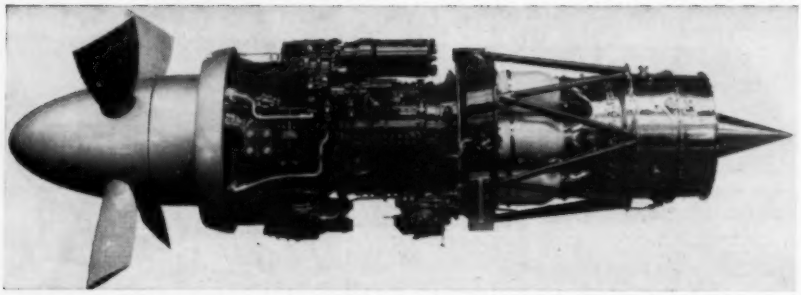

ELAND: "Lightest and most economical in its class."

Napier Bids for Share of U.S. Market

British firm bases hopes on three engines: the Eland, Nomad, and Oryx; first will power Fairey Rotodyne.

By ANTHONY VANDYK

ARMED with a trio of unusual and extremely interesting engines, a little-known British company is making a determined bid to enter the U.S. market.

The company is the 146-year-old D. Napier & Son, since 1942 a component of the giant English Electric Group (1953 net profit: $4,350,911) which has just become the first British firm to have a full-time aviation representative in Washington (223 Dupont Circle Building, 1346 Connecticut Avenue).

The products that Napier is offering for sale or license production are:

• **The Eland,** a 3000-plusehp engine weighing 1575 pounds dry with a frontal area of only 7.1 square feet. It is claimed to be the lightest and most economical engine in its class.

• **The Nomad** compound diesel engine which features a very low specific fuel consumption (between 0.33 and 0.35 lb./ehp-hr.) over a wide range of altitudes and speeds.

• **The Oryx,** a turbine gas producer of about 1000 lbs. thrust with applications in both the fixed-wing and rotorcraft fields.

The new Napier trio may revive the company's fame as an aircraft engine designer, which started with the Lion, Britain's outstanding engine of the 'Twenties and continued into the 'Forties with the Sabre, a remarkable 2400-hp liquid-cooled unit with 24 small sleeve-valve cylinders. This was Britain's first engine in the 2000-hp class (it eventually produced over 3000-hp).

Since World War II the Napier production plant at Liverpool has started producing Avons under license from Rolls-Royce, whereas the home factory at Acton, a London suburb, has been working on the new trio with only limited government support.

At the moment it seems that the Eland has the biggest future of the trio. This turboprop is to power the Fairey Rotodyne and there is a likelihood that British European Airways may use it to re-engine its Airspeed Ambassadors, which now have Bristol Centaurus piston engines.

It is an attractive engine due to its low weight (1575 lbs. net dry and 0.525 lb./ehp specific), extreme cleanliness of design and frontal area of only 7.1 sq. ft. (including accessories). This results in an overall cowled shape of unusually high aerodynamic efficiency which, coupled with a specific fuel consumption which is little over 1.5 lb./ehp-hr., an outside diameter of only 36 in. and a length of 122 in. makes it unusually favorable in size, weight and fuel consumption.

The Eland has a ten-stage axial compressor with six combustion chambers and a three-stage turbine.

The Eland has now logged about 1000 hours on the bench and is due to start flying in a Vickers Varsity this month. About six engines have been built so far and the present program calls for production to get under way next fall.

The Nomad is in a more advanced stage than the Eland since the Nomad I accomplished 900 hours on the bench and 100 in the air before the more simple Nomad 6 was produced. Latter has now run for over 200 hours on the bench and should fly in an Avro Shackleton this month. About 12 Nomads have been built.

The Nomad consists of a simple valveless two-stroke diesel engine compounded with a gas turbine. The axial compressor and multi-stage turbine are on a common shaft which is coupled mechanically to the diesel engine through gearing. Power from the piston engine and the surplus power from the turbine are both transmitted to the propeller.

The combination utilizes higher compression and expansion ratios and thereby achieves a specific fuel consumption much superior to the conventional turbine engine. Moreover, the engine will operate with equal efficiency on diesel oil, kerosene or wide-cut gasoline.

The following are the latest basic data for the Nomad: weight, 3580 lbs.; engine length, 9 ft. 11 in.; frontal area (power plant), 19.25 sq. ft.; static rating, 3135 ehp; specific fuel consumption, 0.33-0.35 lb./ehp-hr.; price (estimated), $80,000-90,000.

The last of the trio, the Oryx, is still veiled in official secrecy and only one is running. It has been estimated that the gas producer unit weighs some 500 lbs. and is about six feet long.

Its projected uses include the powering of a small Percival helicopter. It produces a large amount of unburnt air which can be used for power boosting (for take-off or hovering) by burning fuel in tip nozzles. Hot gases passing through the blades would give automatic de-icing.

Another projected use for the Oryx is in the Percival P.87 transport (AMERICAN AVIATION, March 1).

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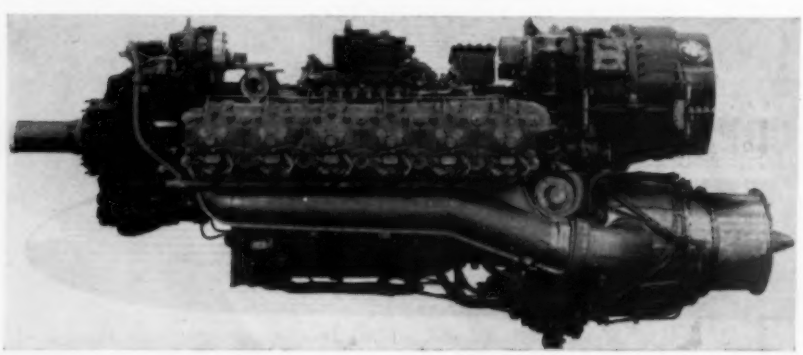

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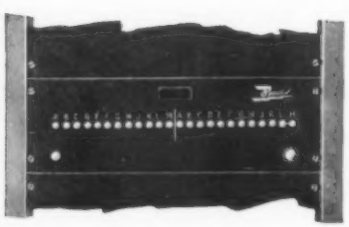

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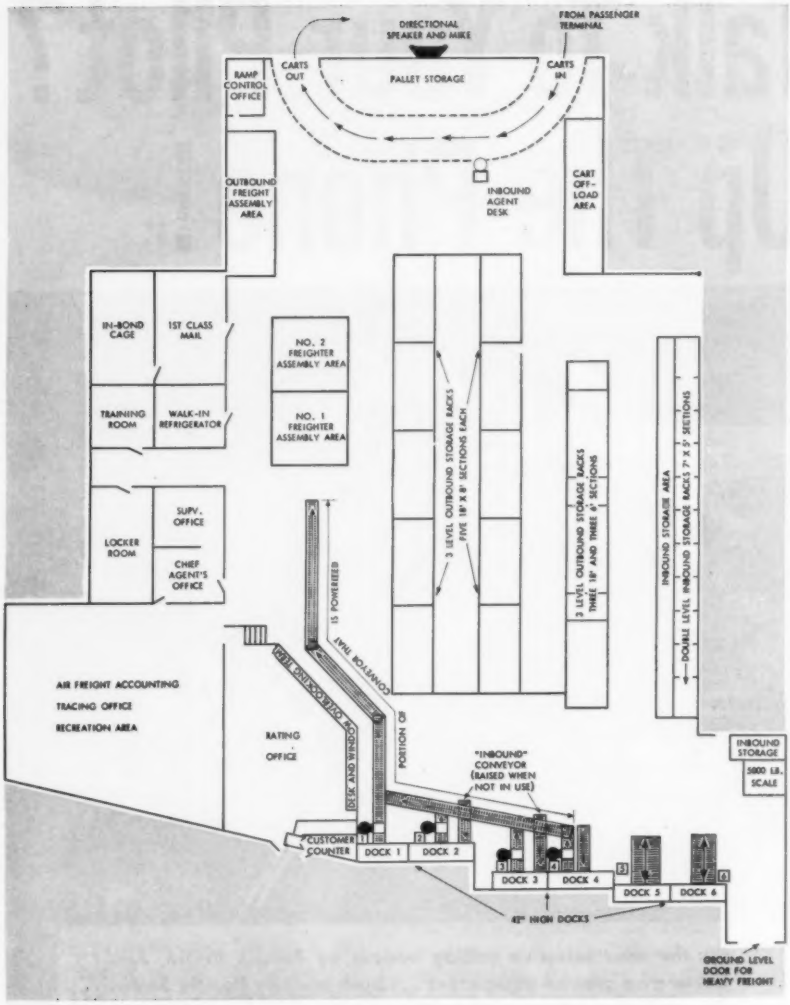


NEW AA TERMINAL combines mechanization with functional layout.

Faster Freight Goal of New Terminal

By Joseph S. Murphy

NEW YORK, N. Y.—A new mechanized air freight terminal, now in full-scale operation here at American Airlines' La Guardia Field headquarters, is a major step by the airline in its program to speed up the ground handling of air freight.

The new La Guardia terminal, while serving AA as a day-to-day operating unit, will also be used as a pilot installation to work the final wrinkles out of its design. According to one official, once it proves itself operationally and the economics of its efficiencies have been studied, the plan is to use this basic design as the backbone for installations at other key freight centers on the airline's system.

On the list are such stations as Chicago, Detroit, Boston, and Buffalo. An installation at Los Angeles, similar to that at La Guardia but on a much smaller scale, is already in operation.

The program at American is being spearheaded by J. M. Glod, superintendent of cargo service, who worked out the master plan for the new terminal. The job of making it operational at La Guardia goes to H. W. ("Bert") Ainsley, who directs the entire freight terminal operation.

The main features:

• **Mechanization:** Precision-built roller conveyors, manufactured by the Alvey Conveyor Mfg. Co. of St. Louis, move inbound freight from the truck loading docks into the heart of the terminal. Special scale sections, built into the conveyors, eliminate an extra handling operation.

• **Rapid Communication:** Rating clerks stationed at work desks near the scales have individual intercom and pneumatic tube systems for quick receipt of tariff information from a centrally located rating office overlooking the terminal; clerks complete execution of airbills on the spot before freight is moved into the terminal proper.

First big test for the new facility came soon after its completion during the peak holiday freight traffic this past December. For that month alone, the La Guardia terminal handled close to 5.6 million pounds of freight, with 3.3 million pounds outbound from New York and over 2.1 million inbound.

Record handling for one day was 327,000 pounds, representing 198,000 pounds outbound and 129,000 inbound.

The terminal is served by six dock stations. Four docks are conveyor-equipped to feed into the powered system; two others are heavy duty units using double-width conveyors for bulky packages or pallet-loaded shipments.

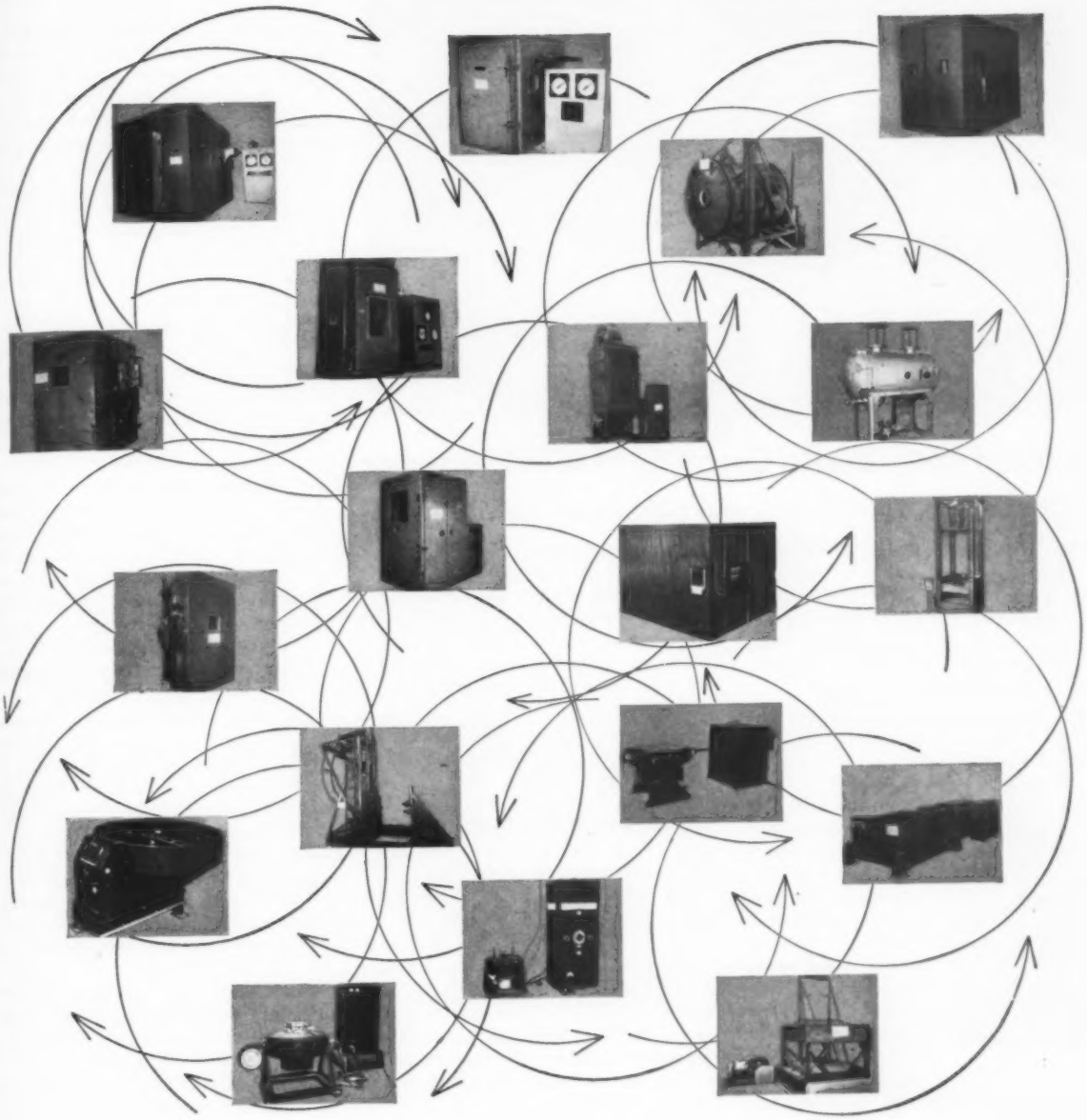
Although the powered conveyor system is used exclusively for outbound freight, i.e. freight departing from New York, AA has provided a standby conveyor arrangement that feeds inbound freight to five of the dock locations. This is made up of the two double units which are usable for freight in both directions, a single fixed conveyor not used for outbound freight, and two movable conveyors which are lifted out of the way by a hand-operated winch when outbound freight is being received at the docks.

Big side feature of the double conveyor units, according to Glod, is their use as a pre-delivery storage area for inbound freight. Here freight can be pre-loaded each morning between 4 and 6 a.m. and set up in a sequence to agree with a pre-determined schedule of pickup by truckers. This provides a direct service to the customer by speeding up turnover of freight to the trucker when he arrives at the dock.

Emphasis on rapid communication in the AA scheme does not stop when freight is billed at the scales. Other special devices include:

• **Dual Telautograph units** in the rating office and ramp control office (see floor plan). One gives freight agents dispatch information on inbound and outbound flights; another registers up-to-the-minute data on flight handling at the passenger terminal.

• **A special Teletalk** speaker-microphone combination mounted on the field side of the terminal. Unit is used to bring the ramp control office into immediate contact with personnel loading airfreighters with instruction on late-arriving freight. Barring engine operation in the immediate vicinity, the sensitivity of this unit is such that a cargo loader speaking at a normal voice level can be heard distinctly in the control office. • • •



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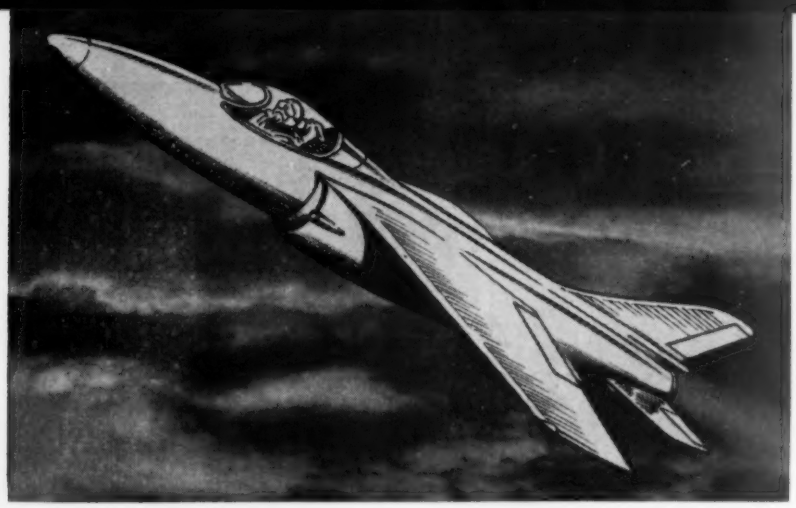


Folland May Build Gnat as NATO Fighter

Reduction in money and manpower needed for construction may make Petter's design a bargain.

By James Hay Stevens
London Technical Editor

LONDON—The confirmation from Fontainebleau that Folland Aircraft Ltd. has submitted a quotation to NATO for a trial batch of Gnat light fighters brings to a head 1953's aeronautical enigma.

Designed by W. E. W. Petter, managing director of one of Britain's smaller airplane companies (but one which has an outstanding reputation for the production of airframe components), the Gnat is an original conception, without a parallel today.

Petter

Originality has always been a feature of Teddy Petter's airplanes. His first design was the slotted and flapped Westland Lysander of 1936, an observation airplane with a speed range of 50 to 230 mph. In 1945 he had the idea of using the jet engine to make a really fast high-altitude bomber—the idea that became the Canberra.

It is about three years now since Petter felt a revulsion from the heavily loaded, elaborately equipped machine that is today's fighter. He was convinced that a light fighter could be built that would do all that an interceptor should, and that such an airplane need cost only a fraction of the money and man-hours of a full-scale fighter.

Petter's considered view was that a real airplane was required, not just an expendable target-defense fighter. He scorned both the rocket and the ramjet because of their extravagance and aimed instead at the modern turbojet equivalent of the Spitfire I of the Battle of Britain.

The premise of this conception was that if war were to come within 10 years—that is by 1960—it would not be fought supersonically, but on the basis of mass daylight raids by TU-4's (B-29 copies) with swarms of MiG-15's as top cover. To counter such attacks a four-to-one numerical superiority of defending fighters is required.

To obtain this number of fighters for deployment along the NATO front from the Baltic to the Mediterranean is impossible, says Petter, if one thinks in terms of a $300,000 weapon. It can be done in the time, and with a reasonable budget, by adopting a $70,000 one.

The second most likely Russian attack would be by light tactical jet bombers and fighter bombers, also operating mainly in clear weather, and certainly at low levels where radar interception is unreliable.

The war in Korea and all that is known of Russia's air forces suggests, Petter says, that blind bombing techniques are relatively undeveloped. Despite this, he points out, NATO is concentrating on all-weather fighters, which by their very size and the complexity of their equipment can neither be built nor operated in the numbers required to cover a 2000-mile front.

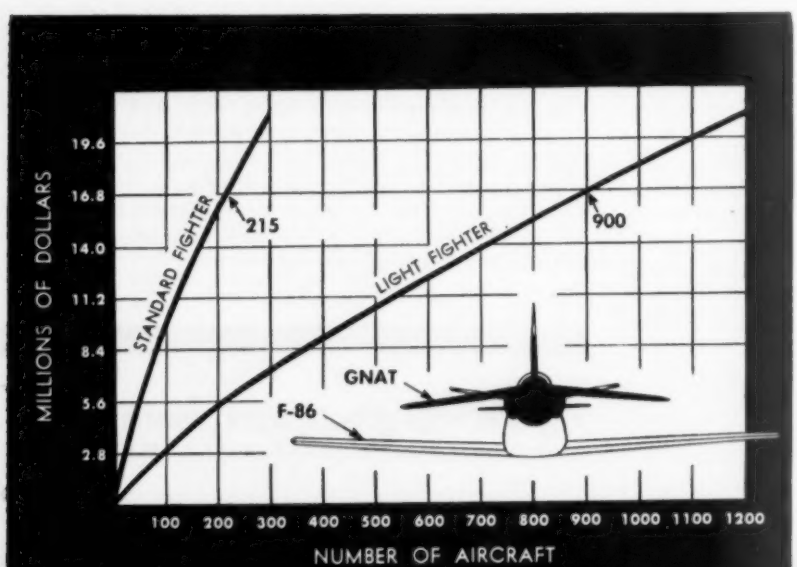
Convinced in his belief, Petter set to work and designed the FO 141, rigidly disciplining himself so that the fighter would not only be small, but would have a moderate wing loading of 40-45 pounds per square foot.

A new engine, the Saturn, first designed by Dr. Stanley Hooker for Bristol, was to be the power unit. This engine, an ultra-simple, rugged axial, was expected to give 4000 pounds thrust for 800 pounds weight.

Then, toward the end of 1952, under the Super-Priority scheme, Bristol was told by the Ministry of Supply to concentrate on the Olympus and the Proteus 3. Undeterred by the disappearance of his power unit, Petter continued with the design and construction of two prototypes to be flown with the latest long-life version of the Armstrong Siddeley Viper giving 1900 pounds static thrust.

The economies of the light fighter can be summarized as follows:

- **Because of larger production run,** and therefore better tooling and greater "learning," unit cost falls rapidly after 200 airplanes;
- **$16,800,000 will buy 215 standard** or 900 light fighter airframes—price ratio better than 4-to-1;
- **The light fighter is one third the weight** of the standard, but man-hours are only one fifth.



LOW COST of Gnat production is charted at left. For the same price: 900 Gnats, 215 standard fighters.

• **Useful load is 42% gross,** compared with 33%, because structure, engine, hydraulics, electrics, pressurization, are simpler.

• **The 6000-pound fighter** can carry two 30 mm. cannon, radar range, and radio navigational aid.

Unit price for NATO tender was $70,000 for 20 Gnats with Orpheus engines and two Midges with Vipers. This is an equipped figure, about half covering engine, instruments, and operational gear.

Orpheus is expected to weight 850 pounds.

Dimensions (these are early figures and have been slightly modified during design development): span, 20 feet 4 inches; length, 29 feet; height, 9 feet 4 inches; wing thickness ratio 8% (later to be 6%); root chord, 8 feet 6 inches.

Such is the pudding, what of its proof?

Gnat and Midge

The Gnat is being built. There are two prototypes in production for which one wing is complete and the first fuselage is well advanced. This first airplane should be ready to fly in September, with the second a few months later.

These two prototypes will have sufficient power from their Vipers to carry out general flying and handling trials, although their performance will not be operational. To distinguish them from the Gnat fighter, this version has been christened the Midge.

Work on a light axial-flow engine has been resumed at Bristol under high priority. This is not the Saturn, but a revised design, the BE26, recently announced as the Orpheus. Petter expects some de-rated flight trial engines by mid-1955 and production engines giving 5000 pounds static thrust by the following summer.

Key: Think Light

Petter says that the only way to design a light fighter is to aim low: the air force will always ensure that the original weight is exceeded. If an equipped weight of 8000 pounds is the target, it will be 11,000 or 12,000 by the time it reaches the squadrons. By aiming at 5000 pounds plus, and accepting radar range and extra fuel as overloads, Petter has kept the Gnat at a maximum of 6000 pounds.

It is not enough, Petter says, to strip down an existing fighter; it is essential to think light from the start. The way this has been put into practice is to tailor the fuselage around pilot and engine, so giving a minimum practical size.

The nose is fairly long, because of the radar range, and a heavy gauge light alloy skin gives deflection protec-

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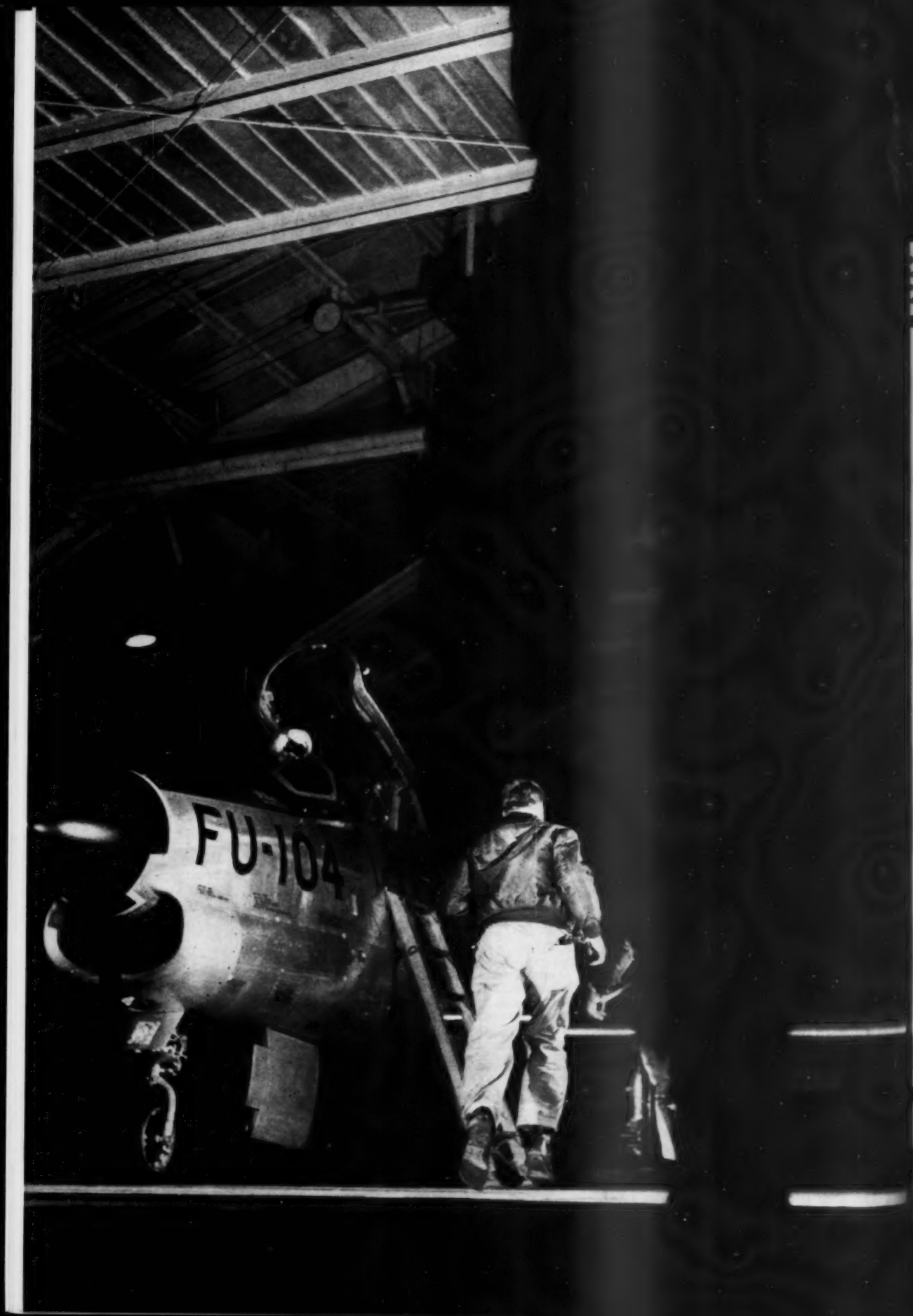
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General Electric jet service engineering in the Pittsburgh area is, of course, part of G.E.'s world-wide jet service program. G-E tech reps are stationed in Japan, Greenland, Germany, England, Puerto Rico, Alaska, Italy, Africa, and Korea. In the United States, jet representatives are available to airframe manufacturers, the Air Force, and the Navy from coast-to-coast.

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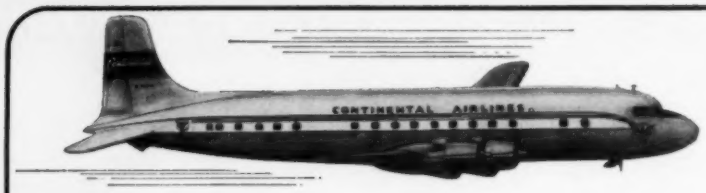

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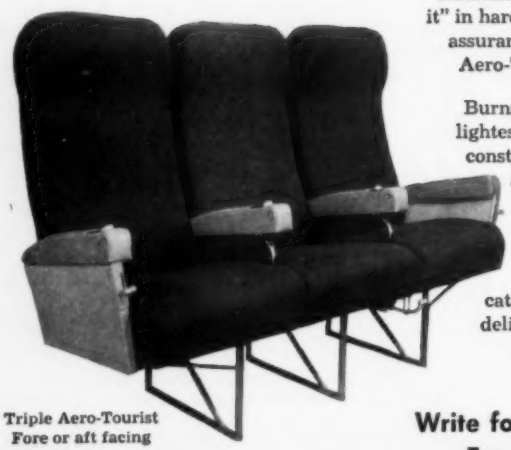

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tion against return fire. Side intakes are used to duct the air into the compressor eye just aft of the wing. The fairing of these intakes is continued aft, giving the fuselage a three-lobe cross section and in the side lobes are stowed the two 30 mm. cannon with their ammunition and link collector boxes.

Fuel is stowed in every possible space in the center fuselage around the ducting and the compressor ahead of the firewall, but jet-pipe tanks have been avoided. A 50-pound ejector seat and single-piece hood also save weight. Tail controls are grouped in a spine fairing running from hood to fin.

Wing loading was kept low, both to preserve maneuverability above 40,000 feet (where the combined effects of low air density and reduced C_L at high Mach numbers causes large increases in turning radius with loadings over 50 pounds per square foot), and to reduce landing speed.

No Flaps

In point of fact, the Gnat has no flaps—yet another way of saving weight. Sealed pressure-balance ailerons will be fitted to the prototypes, but in the light of experience with recent airplanes on both sides of the Atlantic, power-operated inboard ailerons will be used on the operational model. Aspect ratio is low, as is wing thickness, and sweep is 40°.

Since the wing torsion box is too small to make it a worthwhile fuel receptacle, the structure is very simple indeed. Closely spaced stringers, simple flanged-blank ribs, folded sheet webs, combine with a moderately thick skin to give adequate strength without any expensive machining processes.

The wing halves are assembled with a center section torsion-box bridge to make a single unit, to which are fixed replaceable tips—giving a span of about 20 feet. The wing is dropped into a notch in the top of the fuselage, where it is held by four spigots, instead of rows of bolts. In this way two main die-stamped fittings can be used to carry the concentrated loads of wing, landing gear and cannon.

Low Stabilizer

The stabilizer is placed low to simplify power trim and to keep the fin structure light.

Landing gear, specially designed by British Messier, is smaller than that of a personal plane. It retracts backward into the fuselage and yet, because of the small span, the track ratio is reasonable. The main wheels go into the intake-duct fairings, while the nosewheel fits in behind the pilot's seat.

Calculations show that the Gnat should have a level speed performance at least equal to that of present day

first-line fighters—Sabre, MiG-15, Swift, Hunter—somewhere between M = .95 and M = 1.1.

Because of the nearly one-to-one thrust/weight ratio, climb should be far in excess of these airplanes. This feature also suggests rapid acceleration after the climb and not the slow winding-up that handicaps some of the new heavy types. The Gnat is also fully stressed for low-altitude maneuvering and is fully adapted to ground attack with underwing loads.

If Petter is correct in thinking that Mach 2 combat will not come before 1960, the Gnat can equal current fighters. Easier production, he maintains, would ensure that a given number would enter service before an equal number of standard fighters. A small airframe factory with, say, 2000 on its staff could make 50 a month.

In the NATO application the Gnat also offers a cheap, high-performance fighter for reserve training. With its speed, climb and swept wing it is more representative than the obsolescent Meteor, Vampire, and Thunderjet. If adopted, it also offers an attractive article for the smaller countries.

Perhaps Petter's strongest case for the economy of his light fighter is that he can build two without government assistance. Operational virtues must, of course, await the proof of flight trials.

• • •

Corporate Planes in '52 Flew 1.9 Million Hours

The CAA reports that business flying activity has increased 900% in 1952 over 1940, with company and individually owned aircraft logging 3,124,000 hours during 1952, about 600,000 more than scheduled domestic airline revenue hours. Of the total, 1,100 company-owned aircraft claimed 1,853,000 hours, with 19,400 individually owned planes accounting for the balance.

Industries leading in aircraft utilization are manufacturing and mining with 616,000 hours; farming and ranching, 559,000; aviation (other than for hire), 427,000; petroleum, 371,000; and construction and real estate, 286,000.

Other hourly utilization figures for other types of non-carrier flying are compared by CAA in its "The Airplane at Work for Business and Industry" booklet.

Using 1952 hourly totals with percentage increases over 1951, figures are as follows: commercial agriculture, increased 3.2% to 707,300 hours; passenger and cargo (including irregular carriers), up 6.8% for 703,000 hours; and patrol, survey, and aerial advertising, up 31.5% to 317,000 hours.

Domestic, Internatl. Load Factors Down

U.S. scheduled domestic trunk and international airlines in 1953 hauled more people and more things more places than ever before. As an industry, however, the carriers experienced declines in the load factor columns, caused in part by the addition of new equipment to their fleets.

The new aircraft, faster, and with more seats, boosted available seat-miles by more than 4 billion (an increase over 1952 of more than 20%) for the trunks, and 631 million (up 13%) for the international carriers.

More room was provided to carry cargo, too, and cargo ton-miles, which includes air mail, air freight, and air express, climbed 8% for the domestic trunks, and 3% for the international group.

A breakdown of the three components shows: domestic trunks, air freight up 15 million ton-miles; air mail up 3½ million; and air express up 2 million; international air freight, up 589,000 ton-miles; air express, down 61,000 ton-miles; and air mail, up 3,000,000 ton-miles.

	Domestic—1953			Domestic—1952		
	Passenger Load Factor	Revenue Passenger Miles	Cargo§ Ton-Miles	Passenger Load Factor	Revenue Passenger Miles	Cargo§ Ton-Miles
	%			%		
AA	67.78	3,226,914,000	80,547,914	72.80	2,837,654,000	72,228,055
BNF *	56.37	469,069,000	5,802,344	61.21	344,807,000	5,071,359
CAP	58.99	716,609,000	9,424,784	57.59	637,579,000	8,392,696
CARIBAIR	54.44	9,815,000	31,027	49.31	8,912,000	42,076
C&S ‡	63.65	69,596,000	1,047,925	61.86	201,085,000	3,082,589
CAI	57.40	94,340,000	503,944	51.11	70,995,000	410,089
CAL	51.54	148,919,000	1,576,646	54.93	139,000,000	1,482,692
DAL **	61.50	625,384,000	10,291,353	64.69	444,149,000	7,462,497
EAL	60.21	2,312,227,000	18,231,511	58.38	1,858,965,000	16,585,601
HAL	57.04	52,309,000	1,455,061	60.28	48,383,000	1,275,167
MCA †	....	.....	.....	53.82	82,226,000	748,776
NAL	66.54	576,813,000	7,734,869	63.19	458,829,000	7,254,793
NEA	55.33	91,538,000	590,114	58.08	84,198,000	584,670
NWA	59.83	723,105,000	8,770,973	65.38	586,903,000	8,519,945
TPA	45.81	19,831,000	107,729	46.45	23,112,000	90,377
TWA	70.76	2,373,193,000	39,584,254	74.96	1,884,976,000	33,407,114
UAL	68.36	2,578,362,000	58,264,422	72.41	2,273,518,000	57,843,044
WAL	58.64	359,965,000	3,710,490	65.94	298,933,000	2,882,268
TOTALS	64.61	14,447,989,000	247,675,360	67.00	12,284,224,000	227,362,908

** Figures do not include operations of local service segment (route 106) now operated by Braniff Airways as result of Braniff-MCA merger effective August 16, 1952.*

† Figures for MCA are for the period from January 1 through August 15, 1952, and do not include operations of local service segment (route 106). Merger between Braniff and MCA was effective August 16, 1952.

§ Includes air parcel post.

NOTE: 1. Figures include both scheduled and non-scheduled operations.

‡ Figures for C&S are through April 30. Merger between Delta Air Lines and Chicago and Southern Air Lines was effective May 1, 1953.

*** Merger between Delta Air Lines and Chicago and Southern Air Lines was effective May 1, 1953.*

	International—1953			International—1952		
	Passenger Load Factor	Revenue Passenger Miles	Cargo§ Ton-Miles	Passenger Load Factor	Revenue Passenger Miles	Cargo§ Ton-Miles
	%			%		
AA	66.30	79,503,000	2,600,507	63.59	89,734,000	2,230,458
BNF	43.33	76,670,000	1,830,200	44.16	80,323,000	1,653,800
C&S *	48.39	13,549,000	450,925	49.73	38,239,000	1,190,158
CAI	69.99	40,480,000	89,173	67.50	29,222,000	87,592
D-C&S †	47.82	29,027,000	973,521	....	.....	.....
EAL	66.54	216,265,000	1,292,471	67.09	161,662,000	969,290
NAL	45.42	45,877,000	475,793	56.03	24,991,000	261,989
NWA	53.65	132,220,000	9,458,208	57.74	134,853,000	9,805,798
PANAGRA	55.62	137,395,000	3,583,722	58.29	133,288,000	3,087,872
PAA						
LAD	65.42	798,881,000	29,612,624	61.43	766,620,000	29,217,435
ATL.	60.98	698,460,000	20,964,499	63.68	620,115,000	20,968,305
PAC.	65.53	447,921,000	13,619,336	66.76	347,751,000	12,142,297
ALAS.	46.85	69,841,000	5,274,476	47.93	72,583,000	6,225,986
TWA	68.15	514,976,000	14,764,251	68.65	439,342,000	13,293,476
UAL	68.47	139,046,000	1,318,342	78.86	129,375,000	1,520,973
TOTALS	62.31	3,440,111,000	106,308,048	62.75	3,068,098,000	102,655,429

** Figures are through April only, since company merged with Delta Air Lines on May 1, 1953.*

† Figures are from May 1, 1953, effective date of merger between Delta Air Lines and Chicago and Southern Air Lines.

‡ U. S. mail ton-mile figures include air parcel post.

NOTE: 1. Above figures include both scheduled and non-scheduled operations.

2. Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu; and United to Honolulu. Operations of U. S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

SKIN PANEL ALLOWABLES INCREASED WITH 75 ST

hi-shears

75ST HI-SHEAR rivets combat "head popping" and wrinkles in skin panels more effectively than 24ST DD rivets. Combining higher material strength and close tolerance heads, the 75ST HI-SHEARS permit higher shear and tension allowables, reduce shop problems and improve surface flushness.

HS25 rivets with the AN426 styled head permits countersinking in skin minimum thickness of .072 or more. Hole preparation is accomplished with same standard tools.

HS23 with the small HI-SHEAR styled head permits countersinking in thin gauges (.051 min.) and eliminates sub-countersinking or sub-dimpling in frame-to-skin attachments, extrusions, stainless steel, titanium or where dimpling clearances are lacking.

HS26 with a flat head attaches thin sheets where bearing is critical. Reduced by ⅔rds the weight of a steel fastener.

- **75 ST HI-SHEARS drive with ½ the force of DD rivets and eliminate "ice-boxing" DD rivets.**
- **75ST HI-SHEARS use the same standard Sets as used in driving steel HI-SHEARS.**
- **75ST rivet pin uses an A17ST HS24 collar (dyed blue).**

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A MILITARY COMMENTARY . . .

Security – The Military Mind at Work?

EVERY NEWSMAN covering military affairs has had his run-ins with security restrictions. There is no logical reason to become irked with such a situation when it arises. But, being only human, we become annoyed when the military services use "security" as an excuse to prevent legitimate information from getting out.

Our latest experiences occurred during a visit to Wright Field last month to view the first public flight of the Russian MiG-15. The plane was kept at a respectable distance from the press and we were informed that no technical details of the Red jet would be given out. When asked why, Air Materiel Command public information officers reported this was not their airplane—they were merely handling the press arrangements for the Air Technical Intelligence Center.

It was later learned that technical details on the MiG-15 had been furnished to ATIC but the latter agency had chosen not to release them, despite the fact that the same data could be obtained from the Air Force press desk in Washington *on request only*.

Reporters were also barred from inspecting the cockpit of the MiG. Why? "Well, we don't want the Russians to know what we have learned about their plane." By contrast, when North American rolled out its first production F-100 last November the press was given a much closer look at an airplane which was and is one of the hottest in production for the USAF.

Another parallel incident: After ascertaining that production of J47 engines by Studebaker Corp. had actually stopped, we asked for several enlightening details including how many J47's Studebaker had produced. The other answers (to questions about total Studebaker contracts, plans for the tools, etc.) were immediately forthcoming but we were told that the number of engines was "classified." It happens that the Air Force several months earlier had given G.E. permission to report it had turned out at least 20,000 jets (most of them J47's) at its plants in Evendale, Ohio, and Lynn, Mass. We fail to see, therefore, how revelation that Studebaker had delivered between 2000 and 2500 more would jeopardize national security.

Still more about security: The Air Force has never officially acknowledged the existence of an XB-58 bomber, although it has stated that Consolidated Vultee has been asked to work up a supersonic design at Fort Worth. But any individual going to the cafeteria at Wright Field's Area B can't help but pass a door labelled "XB-58 unit" containing the names of about a dozen project engineers. Also, while USAF statements have never mentioned a Talos missile, the unclassified Wright-Patterson weapons systems phone book indicates a Talos project.

The Air Force is almost blameless on this next one because AF leaders have continually warned that no air defense setup is foolproof and that some enemy attackers will get through. On the other hand, the public is constantly spoon-fed publicity about the nation's air defense units being on the alert 24 hours a day, ready to intercept any unknown aircraft at a moment's notice.

USAF public relations personnel failed to jump at the chance to report on interceptions of at least two recent flights. One involved a Wright-Patterson B-29 which was scheduled to make a practice run over Dayton after trying to evade interception by U.S. jets. The B-29 (a World II piston bomber which the Russians have copied as the Tu-4) was located by interceptors over the Great Lakes but by using evasive action completed a simulated bomb run.

The other incident involved a Canadian F-86 which was making a routine flight between two Canadian air bases. The Sabre lost its bearings for some reason and ended up in St. Louis, Mo. On its flight from the border to the Missouri city, the AF picked up the plane on radar scopes but never once succeeded in intercepting it. The USAF units had no way of knowing that it was a Canadian rather than a Russian fighter.

. . . ROBERT M. LOEBELSON

They're pioneering jet-to-jet aerial refueling

Aerial refueling has been described as one of the most significant advances in recent aviation. It progressed another important step forward when a specially fitted Boeing B-47 bomber made the world's first jet-to-jet transfer of fuel aloft—refueling first a jet fighter and later a companion B-47 Stratojet.

The modified Stratojet that acts as tanker in this continuing test program is a 10-mile-a-minute medium bomber fitted with fuel tanks, high-pressure pumps and lines. Designated the KB-47, it is demonstrating the practicability of aerial refueling at the extreme altitudes and high speeds at which modern jet aircraft normally operate.

While Boeing's piston-powered KC-97, the standard Air Force tanker, is admirably suited to the needs of today and the immediate future, tests with the experimental KB-47 prove the feasibility of transferring fuel at jet speeds. These tests also pave the way for the development of a jet-powered tanker large enough to carry ample cargos of fuel, and fast enough to deliver it aloft to jet fighters and jet bombers at the speeds and altitudes at which they function most efficiently.

Such a jet-powered tanker would be capable of accompanying jet aircraft on their missions, and refueling them by one of several proved methods without the necessity of cutting back to lower speeds and dropping down to lower altitudes.

Recognizing the coming need for an advanced jet transport, Boeing is constructing a prototype aircraft designed to be adaptable for either military or commercial use. This undertaking, in which Boeing is investing its own funds, grows naturally out of the company's leadership in the field of large, multi-jet aircraft, and out of its unparalleled background of experience designing and building aerial tankers and aerial refueling equipment.

The integrity of Boeing design, research and production is assurance that the coming Boeing jet tanker-transport—like the earlier Flying Fortresses and Superfortresses, and the new B-47 and B-52 jet bombers—will be an aircraft on which America can depend.

This crest is symbolic of the Strategic Air Command's strength and global achievements. It is found on such Boeing planes as the B-29, B-50, KC-97, B-47 and shortly will take its place on the B-52.

BOEING

Melpar to Market In-Flight VOR Checker

New unit adds voice check to visual indications; offers special benefits to private flyers.

A NEW PIECE of navigational equipment which will provide additional safety for planes flying the VHF omnirange, and possibly introduce a complete new low-cost system of navigation for personal planes, will be placed on the market within two months.

Officially known as the Aural Bearing Generator (and VAOR for Visual-Aural Omnirange), the new device was designed and built by engineers at Melpar, Inc. of Alexandria, Va., research division of Westinghouse Air Brake Corp. Ultimately the production of the unit will be handled by the Union Switch and Signal Division of Westinghouse.

Tests by both the airlines and the Civil Aeronautics Administration have already demonstrated the value of the VAOR, which in its earlier trials was known as the "gross error checker."

The Melpar unit was originally designed by Vernon Weihe, long associated with technical aspects of electronic navigation, to provide the pilot with a means of checking his VOR receivers in flight. Such a check is necessary, Weihe believes, because partial or creeping failures of VOR components can result in erroneous navigation information which cannot be detected in the cockpit with existing equipment.

Recognizing that an aural check on the accuracy of the airborne VOR equipment would provide the pilot with greater assurance, while increasing the system reliability to a point where it could be used effectively in traffic control, the Melpar engineer developed the omni-bearing generator.

It is particularly acceptable to aircraft operators because it does not require additional equipment in the aircraft. In fact, private pilots without VOR receivers, but with VHF radio, can use signals from the VAOR to fly a reasonably straight course.

Pilot Acceptance

Pilot acceptance of the device has been exceptionally good, even in the prototype installation which has since been improved upon. This prototype was installed on the VOR at Tilden, Indiana, almost a year ago and tested by pilots of CAA, Eastern Air Lines, Delta Air Lines, and United Air Lines.

In answering questionnaires on the unit's operation all of the pilots, except three of 17 EAL pilots, endorsed the unit as "a good check of (VOR) equipment operation" and agreed, except for four EAL pilots, that it appears to be accurate.

In operation the VAOR transmits a voice signal over normal VHF receiver frequencies. This signal consists of a voice count starting from zero and going to 180 in 10° increments. The signal is transmitted over the VOR antenna.

During the greater part of each rotative cycle the voice is drowned out by an overriding tone transmitted in a figure-eight pattern by use of the VOR directional antennas. In the null formed by the directional pattern of the antenna, the voice from the magnetic drum of the omni-bearing generator comes through clear.

Thus, assuming the pilot is on a heading of 120°, the numbers 100 and 110, transmitted from the VAOR and received in the VHF receiver, will be indistinguishable because of the overtone. Then 120 will come through clear. Following this 130, 140, etc. will also be masked by the overtone.

By simple interpolation the 10° separation of the voice signal can be read to well under five degrees. Tuning his VHF receiver, without benefit of any VOR attachments, the private pilot can use these signals for "rough" navigation.

The prototype installation of a year ago has been redesigned by an engineering group under Bernard R. Boymel of Melpar's research group and repackaged to fit in a cabinet 42″ high, 22″ wide, and 19″ deep.

Operationally the most important change has been the use of a larger magnetic drum on which to record the voice signals. This has increased tape speed from 1.3″ per second to 3.9″ per second. The increased speed gives greater fidelity of voice reproduction.

Melpar is working on a "squelch" unit which could be added to the aircraft if the pilot wants to eliminate the overtone and only hear voice announcements corresponding with his particular azimuth from the station. • • •

24 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS
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CURRENT PROJECT at Breguet is the 940 transport, featuring giant propellers and flaps, which combine to produce very high lift.

New Projects in Design Mill at Breguet

High-lift transport and vertical take-off fighter under development by builder of the "Deux Ponts."

By JEAN-MARIE RICHE
Paris Editor

PARIS—Since 1952, when the first double-decked transport was delivered to Air France, the French national airline, seven more Breguet 763 "Deux Ponts" have been put into operation on that carrier's medium high-density routes totalling a length of 8700 miles.

Breguet

On the Western Mediterranean runs where it is mostly used, the "Deux Ponts" carries up to 107 passengers in two classes. This aircraft is also operated with combined passenger-cargo accommodations, especially during off-peak periods for passenger traffic.

No serious bugs have been encountered during the initial period of utilization of the "Deux Ponts" whose yearly average potential of flying hours will be progressively upped from 1800 hours to 2400 hours, a pretty good rate for an aircraft flown on short-haul routes.

Equipped with Pratt & Whitney 2800 CA 18 engines, the Breguet 763 was built with the help of ECA credits which helped both to rehabilitate the French aircraft manufacturing industry and to add a valuable asset to the French economy.

Besides its satisfactory record with Air France, an earlier version of the "Deux Ponts," the Breguet 761 S, has given good results with British independent Silver City Airways. On the Berlin airlift the aircraft carried, in 80 days, 1170 tons of cargo in 128 round trips, an average of 13 tons per flight. Silver City, which needs an aircraft bigger than the Bristol "Freighter" to expand the successful cross-channel ferry operations and which operated the 761 S on loan, contemplates purchase of three "Deux Ponts."

Louis Breguet, French pioneer aircraft manufacturer, emphasizes that at this time no aircraft corresponding to his "Deux Ponts" is available on the world market.

In the light of the number of inquiries which it receives from all over the world, the Breguet company is negotiating with the French government for immediate production of another batch of "Deux Ponts." Jigs and equipment now used for construction of the four remaining 763's, and spares for Air France will soon be available.

Changes in the programs of the French Navy had not, until recently, permitted the development of the Breguet "Vultur," a carrier-based attack aircraft equipped with one "Mamba" turboprop and one Nene turbojet.

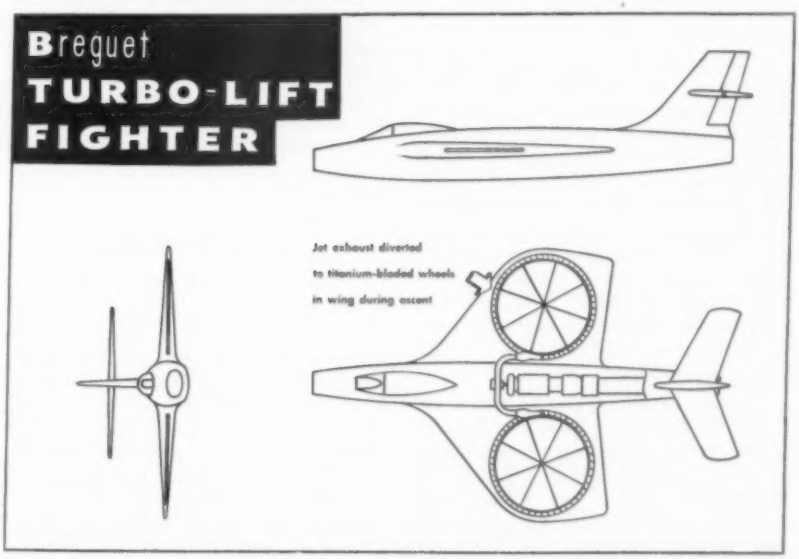
With no current production fitting the requirements of the French Navy now available in the U. S. or in the U. K., a new version of the "Vultur" —designated 960 ASW— is now being developed. Powered only with a Mamba 6, the 960 ASW single package hunter-killer will carry two radar operators in addition to the pilot. Armament will consist of rockets, depth charges and bombs, etc.

The prototype is due to fly in a few months. Successful accelerated tests may result in a production order to equip with modern planes the carriers lent by the U. S. Navy, in order to make their use in Europe more efficient.

In addition to this design, Louis Breguet is now concentrating on two projects for which he has contracts from the French government: the 940 transport and a "turbo-lift" fighter.

The Breguet 940 is a convertible transport, the prototype of which is scheduled to fly early next year. This airplane is equipped with four Turbomeca engines. It features propellers of great diameter. Their action in combination with a set of broad and vertically retractable flaps can lift the aircraft almost like a helicopter when all flaps are fully extended. It behaves as a normal plane when the flaps are fully retracted.

At low speed the effect of the pro-



ALSO UNDER STUDY by Breguet is a fighter design in which jet exhaust would be diverted to turbines in wings for lift, sent back through normal tailpipe when plane reached altitude.

peller-flaps combination is still further accentuated by varying the pitch of the propellers. Breguet contends that this formula is the simplest for a real convertible aircraft. There is no special mechanical complexity or novelty involved in the project.

Speed of the 940 will be much higher than that of a helicopter. Initial price and operating costs compare very favorably with those of conventional four-engine transports now in use.

Built to carry 12 passengers at a block speed of 200 mph, at a cruising altitude of 10,000 feet, the Breguet 940 will have a range of 500 miles with a minimum payload of 2865 pounds. It will take off in 70 feet and land in 115 feet, and has a similar range with a payload increased by 50% if it uses 300-foot runways.

The structure of the aircraft has been designed for a greater total weight. The payload could therefore be still further increased if normal runways were used.

Using his own wind-tunnel, Louis Breguet is becoming increasingly specialized, more and more specializing in studies of aircraft operated at slow speeds and has become actively interested in all problems of lift.

Besides the transport project, Breguet has a military design under study which features comparable qualities. This "turbo-lift" fighter can take off vertically by deviating the flow of the jet exhaust to titanium turbine wheels buried in the wings. Rotation of these wheels yields a tremendous lifting power.

Once the aircraft has reached its operating altitude, the jet flow is directed toward the normal exhaust pipes, while the buried wheels are covered with small movable panels.

Breguet is also active in the field of research on new structural designs. The firm has contributed to the problem of building cheap missiles with easy-to-obtain raw materials through the development of pre-stressed concrete wings, the finish of which is remarkable. For production of these wings, Breguet uses special moulds and an artificial steam drying process which would permit mass production at a high rate. Pre-stressed concrete wing structures are now being built for SFECMAS delta-wing fighter.

Louis Breguet's headquarters are located in Paris but production facilities of his company, whose general manager is Mr. Gandilhon, are distributed among his plants of Villacoublay, Toulouse, and Anglet. Together they now employ 2000 workers. Breguet's design staff is reputedly one of the most capable in France and is considered the company's best asset.

One Manufacturer's Insurance

On a large twin-engine aircraft

Type of Insurance	COVERAGE Per Person	Total	Annual Cost
Hull		$175,000	$6,562
Bodily injury-non-passengers	$250,000	2,000,000	53
Property damage		2,000,000	231
Bodily injury-passengers	300,000	3,500,000	6,043
Medical payments:			
Blanket medical expense	1,000	15,000	353
Weekly disability payments	200	156,000	
Pilot accident, death, and dismemberment	25,000	50,000	456
Total annual cost			$13,698

Safety Keynotes Corporate Flying

By Lois C. Philmus

SAFETY is the keynote of all business flying. While the companies follow CAA and CAB regulations and limitations closely, many have gone a step further by imposing even more rigid rules.

Examples of this attitude are contained in a report titled "Managing Company Airplanes," prepared by the National Industrial Conference Board for its membership. One hundred thirty-one companies operating aircraft participated in the study, along with the National Business Aircraft Association.

The report ascertained that the most common weather limitations observed by the companies are ceiling and visibility requirements. In the case of planes with little or no instrument equipment, there usually is a flat regulation the planes are to be flown VFR only, as ruled by Federal regulations.

With aircraft containing proper instrumentation, company regulations are tighter than CAR requirements. Many require a 1000-foot ceiling with one-mile visibility.

Typical Regulations

Typical company regulations cited by the report are as follows:

"No flight shall be authorized in any company plane any part of which will be made when weather conditions as shown by weather reports to be less than 800 feet and 15 miles, and/or 1000 feet and eight miles and/or 1500 feet and three miles at point of origin, en route or at destination. For operations on instrument, there shall be an airport within a 135-mile radius of flight en route with weather conditions steady or improving. Flights may not be terminated with ceilings less than 1000 feet and visibility of less than one mile."

In the case of loading, majority of cooperating companies reported to NICB that maximum gross take-off weights are based upon CAA and manufacturer limits set up for type of aircraft in service. Several companies go a step further however, deducting about 10% or 15% from the maximum figures as an added safety factor.

Other typical company limitations include:

• **Fuel**—One operator specifies an additional 45-minute fuel reserve above the CAB requirement of 45 minutes, for an hour and a half fuel reserve total for the twin-engine equipment flown.

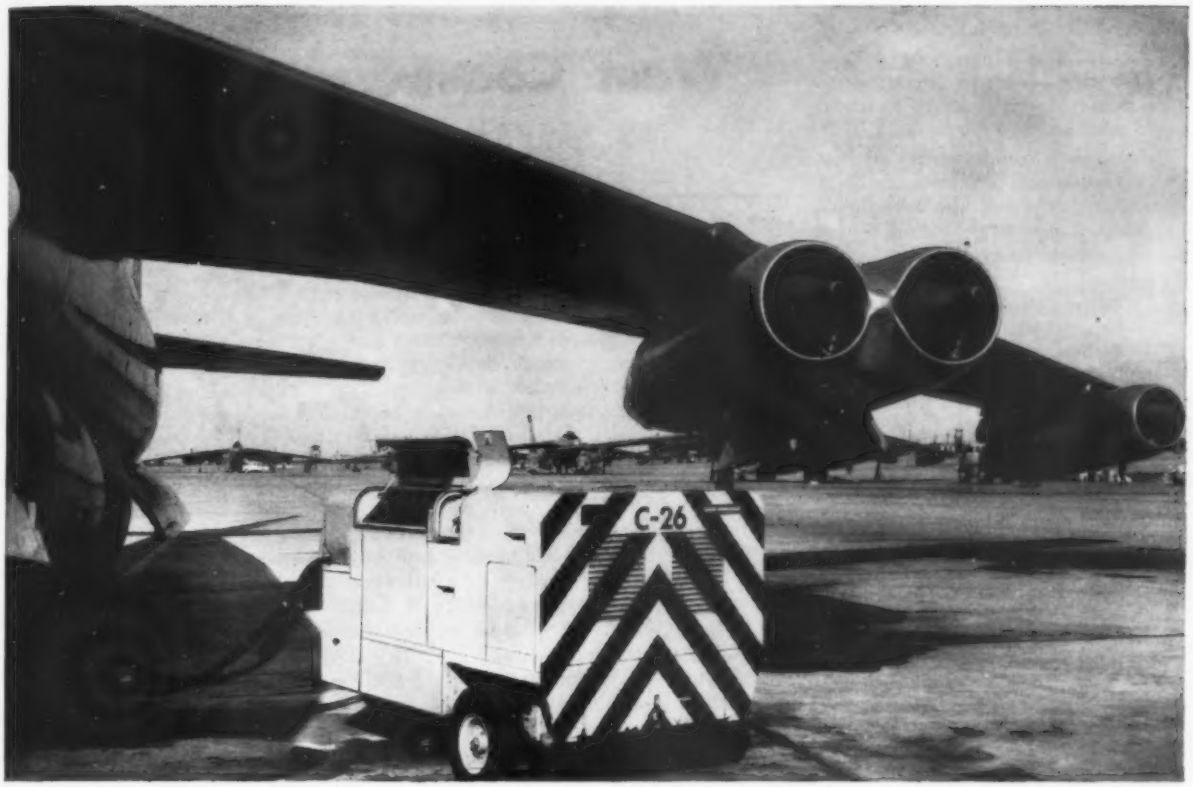
• **Routes**—Planes are not to fly over areas where radio contact can be lost for more than 30 minutes; over uninhabited areas at greater distance than 50 miles from nearest permanent settlement; over areas where landing facilities are not available within 135 miles; and direct route deviations allowed only to avoid terrain, unfavorable weather, large bodies of water, and restricted areas.

• **Engine power**—Several companies stipulate cruise powers ranging from 55% to 62½% of rated horsepower for each engine.

The companies, even those setting up special limitations, leave the final decision to the captain of the plane. His judgment is considered to be rule and regulation.

Insurance is another of the many subjects analyzed by the special report. Most commonly reported types of coverage are aircraft hull insurance, property damage liability, bodily injury to passengers and non-passengers, and medical payments.

"None of the costs shown can be said to be 'typical'," the study points



ADRENALIN for JETS

Spinning massive jet engines from a dead stop to thousands of revolutions per minute was a problem created by production of America's newest jet bomber and fighter aircraft.

How to avoid slow and sluggish jet engine starting? How to prevent excessive strain and drain on the aircraft's own electrical energy system? How to prevent dissipating uselessly high voltage needed for accurate operation of delicate electronic instruments?

The Beech-designed *C-26 Generator* today supplies just such important "adrenalin for jets" – as a self-propelled generating system, it has the super power to whip thousands of jet-engine horsepower into throbbing action within seconds!

Because of the Beechcraft produced C-26 Generators, jet aircraft now can become airborne with greater speed and efficiency. In addition to producing three important military trainer-transports, Beech Aircraft is privileged to produce the C-26 Generators for the United States military aircraft services.

Beechcraft

Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Beech Builds: USAF T-34A • USAF L-23B • USAF C-45H • USN SNB-5 • Model 35 Bonanza • Model 50 Twin-Bonanza • Model 18 Executive Transport

out, "since rates vary with usage, equipment, and personnel involved."

An insurance program for a large manufacturing company operating a large twin-engine aircraft is presented in the table on page 42.

The pilot's compensation, in most cases, is additional insurance to cover flying activities. Pilots also are eligible for group insurance and compensation available to non-flying employes.

Insurance Restrictions

Life insurance restrictions on personal policies carried by executives using the aircraft relative to flight coverage exist on older contracts. Some companies suggest that by paying a slightly increased premium, the executive can have an airplane travel clause inserted.

"Managing Company Airplanes" was written by Leonard R. Burgess and Malcolm C. Neuhoff of the NICB division of business practices. It is available to members only, with the exception of government and educational agencies. It was prepared to (1) enable current operators to improve operations and (2) to be used as a basis for companies wishing to operate their own aircraft.

• • •

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West Coast Talk

By Fred S. Hunter

JEFF O'HERN brought it up . . . Jeff is one of North American Aviation's bright young men . . . He shoots trouble on airport problems for **Lee Taylor** and **Ed Ryan** . . . That means he works on noise . . . Noise is practically a daily crisis for a jet manufacturer these days . . . "A jet," Jeff protested righteously, "is no noisier than a four-engine transport" . . . This appeared to be a claim meriting investigation, so we tuned up our hearing aid and listened in . . . Sure enough, the F-86D taking off from Los Angeles International Airport was no noisier than the TWA Super Constellation that followed it down the runway . . . Now we are aware of the fact that the Super Connies TWA currently is flying have short stacks which certainly have no muffling effect on the plane's Wright R3350 engines . . . Moreover, we'll concede that the Super Connie was taking off on a transcontinental flight and was heavily loaded, whereas we haven't the faintest idea of how much fuel the F-86D had aboard . . . But the F-86D cuts in an afterburner for take-off and this is a fiendish device when it comes to producing a distractive din . . . So, all in all, we'd say O'Hern is perfectly justified in his contention.

But what does it mean? . . . The F-86D has one jet engine; the Super Connie has four piston engines . . . Shall we say a four-engine jet transport, like the Boeing 707, is going to be four times as noisy as today's four-engine, piston-powered transports? . . . But wait a minute, the Boeing 707 has four P & W J57's . . . These are huskies; they'll push out 10,000 pounds thrust each, without afterburners . . . The F-86D's J47-GE-17 is Air Force rated at 5200-plus pounds thrust . . . Drop around the latter part of next month or early in May . . . North American will have production J57-powered F-100A's taking off at L. A. for flight test with a fair degree of regularity by then, and you'll be able to determine for yourself whether Jeff may have to compose a new tune to sing.

•

If you think the jet noise problem may possibly be exaggerated consider the following capital expenditures made by the aircraft manufacturers in sound abatement equipment for engine runups: North American Aviation, $1,455,000; Douglas, $587,000; Lockheed $400,000; Northrop, $300,000. This is not only to quiet complaints of neighbors, but for the benefit of employes working in the area.

•

When **Johnny Martin,** chief test pilot for Douglas, flew into Santa Monica with the company's new Bell 47, the boys in the flight department rolled out an abbreviated red carpet by way of greeting. Seems after Douglas decided to buy the helicopter, President Donald W. Douglas casually asked Johnny one day whom he intended to assign to fly it. Martin named **Jack Armstrong,** one of the company's more experienced test pilots. "Aren't you going to fly it?" asked Douglas. The hint was enough for Johnny. He hastened to Fort Worth to check out on the craft and took **Bert Foulds,** assistant chief pilot, along to be his co-pilot on the delivery flight from Fort Worth to Santa Monica.

•

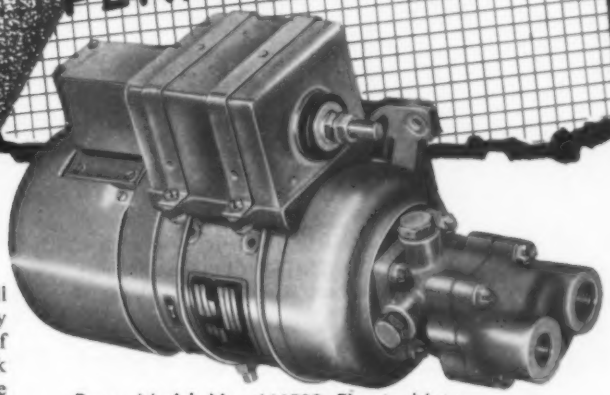
If Lockheed and North American don't look out the T-33B and the TF-86F might cross paths on their demonstration tours of Air Force and Navy bases. The competition between these two new trainer ventures can become fierce enough without having the two demonstrators hit the same base at the same time.

•

Employe credit unions in aircraft factories are accumulating more money than they know what to do with. For example, financial statement of Lockheed's California union showed assets at the end of 1953 of $6,000,000 and loans of $2,655,000. The unions need borrowers, too. Step up and make a touch.

SIMPLE EQUATION:

Pesco PRESSURE-LOADED PUMPS = DEPENDABLE PERFORMANCE



Pesco Model No. 111530 Electric Motor-Driven Hydraulic Pump with 0.056 cubic inch displacement. 1.3 gpm @ 3000 psig, 26 Volts. Weight 28 lbs.

Engineers responsible for the design and operation of all types of aircraft never compromise on dependability. By this same logic, they rely on the experience and ability of Pesco for fuel and hydraulic pumps that will insure peak performance. They know from long experience that the dependability of Pesco products results from several factors—all of them important to aircraft design and operation.

First there is Pesco experience. Since 1933 Pesco has concentrated its full facilities on the continuous development of aircraft pumps, motors, and accessory equipment. The successful solution of thousands of pumping problems has provided Pesco with unmatched "know-how" in pump design, characteristics, and application.

Then there are Pesco engineering and research—continuous and complete services using advanced technology in both design and materials to provide improved products and solutions to pumping problems.

And finally there are Pesco production facilities—geared to produce precision units in volume. High-precision machines and advanced production and testing techniques are reflected in the consistently high quality of all Pesco products.

These same Pesco advantages can be used to solve your specific pumping problems successfully. Simply call or write the Home Office, Bedford, Ohio.

YOU CAN RELY ON

PESCO *Pressure Loaded* PUMPS

FOR THESE ADVANTAGES

DEPENDABLE PERFORMANCE
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AUTOMATIC ADJUSTMENT FOR WEAR
•
LESS MAINTENANCE

Call or write the Home Office, Bedford, Ohio for full information on these Pesco products as applied to your specific installation.

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Maintenance Bulletin Board

PRESENT OVEN HEATING CYCLE is 30 minutes. Shown inspecting parts are Foreman Robert Bauer (left) and H. W. Scott, mechanic.

'Far-Infrared' Used to Heat Cylinders

A new engine cyclinder oven which uses the "far-infrared" principle of radiant heating is being used successfully by Capital Airlines to pre-heat cylinders for installation of shrink-fit parts. The airline estimates that the new unit has increased cylinder production by 30% and saved 25 man-hours weekly, while providing cleaner and cooler shop working conditions over the gas torch method used in the past.

The first model of the new oven was built by Capital mechanics about nine months ago. It has been so successful in this short period of time that a second unit was recently completed as part of a shop expansion program to meet the engine production needs of the airline's enlarged fleet of Lockheed Constellation aircraft.

The oven is a tunnel-shaped unit 7 feet long and 2 feet 6 inches wide. It is fed by a conventional roller-type conveyor. The interior is made up of six Chromalox electric radiant heating units, each rated at 3.6 kilowatts, that run lengthwise through the oven. The elements are enclosed in the insulated oven shell, which is mounted on a structural framing over the conveyor line.

The Chromalox units used by Capital are produced by the Edwin L. Wiegand Co. of 7500 Thomas Blvd., Pittsburgh, Pa. According to Wiegand engineers, the "far-infrared" heat produced by these elements is readily absorbed by the cylinders, which would reflect a large percentage of ordinary "near-infrared" rays produced by lamps.

Cost to Capital of the complete oven unit was about $850, engine overhaul shop foreman Robert Bauer estimates. Bauer is credited with the idea of using the radiant heat principle for the cylinder work. Actual design and construction of the oven in CAP's shops was spearheaded by mechanics A. C. Titus and H. W. Scott with the technical assistance of Wiegand representatives.

In routine operation the cylinders are fed into the oven on a manually operated conveyor at the rate of one every five minutes. Capacity of the oven is six cylinders, hence the complete heating time for each cylinder is 30 minutes. However, this does not represent the maximum output of the unit, Bauer says, indicating that should production demands require, the heating cycle could be shortened and a powerized conveyor and timer installed to mechanize the operation further.

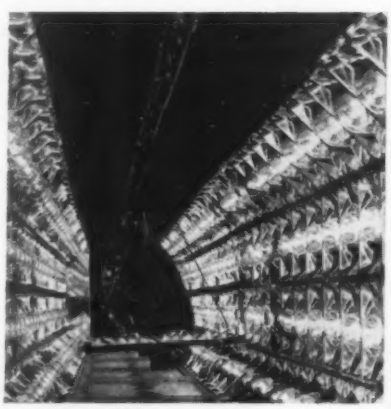
Savings estimated by Capital are based on current engine production required to satisfy DC-3, DC-4, and Constellation fleet operation. This weekly schedule now calls for overhaul of six R-2000, two R-3350, and two G-202A engines, or a total (including spares) of about 150 cylinders.

AA Plans Improvement In DC-7 Fire Detection

Reports that American Airlines is considering removal of the Walter Kidde continuous fire detector system in its Douglas DC-7's have been discounted by AA's vice president of equipment and development, M. G. "Dan" Beard. However, AA has a three-phase program to improve system operation and eliminate "bugs" which have been causing a number of false warnings, Beard told AMERICAN AVIATION.

Program calls for:

- **New cockpit switch** to permit pilot to select individual loops of the dual system and weed out false warnings that may exist before taking fire prevention action.
- **Reworks to eliminate** 90% of present system weak spots. Trouble areas involve non-support of compound curves in loop installations which expose them to vibration and wear, and loose connections which are susceptible to moisture accumulation and result in false warnings.
- **Ultimate program** is to install shorter loop elements for easier maintenance. Those in present design are too long, AA feels, and require excessive maintenance time to replace.



Quick-drying infrared lamp fixture recently installed by Southwest Airmotive Co., Dallas, processes newly painted engine parts in 12 minutes. Unit is 35 ft. long, uses 256 375-watt lamps, and consumes 96,000 watts per hour.

Watch that Passenger . . .

He's an American. He goes by air, on business and for pleasure; knows most of the airlines and their aircraft. *Watch that Passenger . . .* Something has happened to him. Recently in Europe he enjoyed an entirely new flying experience — the Viscount. Never had he stepped off a plane feeling so fresh. Never had he flown in a cabin so quiet or so free from vibration. *Watch that Passenger . . .* Now he's home he expects equivalent comfort — and that means turbo-prop Viscounts.

In its first six months of service with British European Airways the Viscount has :—

- ***Earned a profit of $179.20 per flying hour.***
- ***Cut inter-city flight schedules.***
- ***Doubled BEA passenger traffic on important routes.***
- ***Achieved a break-even load factor of 51 %, covering all costs.***

Also in service with Air France and in production for eight airlines, including TCA and BWIA.

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FOUR ROLLS-ROYCE PROPELLER-TURBINE ENGINES

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Extra Section

By Joseph S. Murphy

HAVING ATTENDED the recent meetings of the Society of Automotive Engineers in Detroit and the Institute of the Aeronautical Sciences in New York, it was interesting to note the impressive turnout of helicopter people on both occasions despite the scheduling of the sessions within two weeks of each other. Judging from the number of really good helicopter papers presented, their efforts were well rewarded. Standout at the SAE meeting was the realistic account of helicopter economics given by American Airlines' **Wayne McMillen,** already being mentioned as a potential award winner.

•

At the IAS session, Mohawk Airlines' Dave Postle and Allegheny's Byron Moe gave good detailed accounts of what should go into the local service helicopter design, although the scheduling of two such similar papers on the same program was somewhat unfortunate. Other papers recommended for reading are the talk by J. B. Edwards of Douglas Aircraft Co. on the economics of a transport helicopter as a DC-3 replacement, and that of New York Airways' president Robert L. Cummings, Jr. on the operational economics of the machine in actual service.

o

During a panel discussion of helicopter fatigue at the SAE meeting, manufacturers were given a pretty dim picture of the possibilities of using shot-peening as a design feature in combatting helicopter fatigue. This viewpoint doesn't seem to coincide with the reported success in the automotive and aircraft engine fields, where its use has become quite prevalent. It would seem in order for SAE to clear up this point at some future session by scheduling several papers on the operational use of shot-peening in both of these areas.

•

Since taking office as Air Force Secretary, Harold E. Talbott has flown some 150,000 air miles, which some statistician has figured out required him to be airborne one full month out of the 12 he has been on the job. During the recent 25th anniversary of simulated flight program at Link Aviation Secretary Talbott told a humorous story of one of his return trips from the Far East. When weather forced his plane to land at one of the Aleutian Air Force Bases, Talbott stopped over to have coffee and doughnuts with the C/O, a Col. Boyd. In talking with the colonel it developed that his wife, who was living in New York, was anxiously awaiting his return to the States, so Talbott took the phone number and generously offered to phone her that same evening on his arrival in New York. Talbott kept his promise too, but when he dialed the number and politely announced that it was Air Force Secretary Harold Talbott calling, Mrs. Boyd quickly replied, "Oh yeah? You and who else?"

•

IT COULDN'T HAPPEN BUT IT DID DEPT.—One airline recently experienced instrument static system troubles on one of its brand spanking new Douglas DC-7's only to find that a static line was partially clogged with cleaning compound. The result? An age-old protection against the problem (painting a red circle around the static vent) becomes an urgent engineering change on the newest of airline transports.

•

A recent Royal Aeronautical Society paper by G. C. Ringham and A. E. Cutler of Redifon, Ltd. on flight simulators tells about a Pan American experience during the training of flight crews in its Curtiss-Wright B-377 simulator. It seems the crew was simulating an approach and the pilot, in correcting for an undershoot of the glide path, called "Take-off power." The flight engineer took off power all right, and the simulator "crashed." Needless to say Pan Am has changed the command to "Full power."

NWA Out to Get 6.5% Of Domestic Market

NORTHWEST AIRLINES is aiming for $65 million in total system revenue in 1954, a modest 5% gain over 1953's $61,996,213, and one of the principal goals is to make substantial progress toward recapturing the position it formerly held in the domestic travel market.

This, of course, doesn't mean there'll be less emphasis on international business; the sales, promotion, and advertising effort in that direction will be bigger than ever. But it does mean that renewed stress is being placed on reaching the goal of performing 6.5% of the total domestic industry passenger-miles, possibly by 1956. Last year NWA flew 5.1%.

The 6.5% would return NWA to the position it held from 1945 through 1950, when it started to dip, reaching a low of 4.6% in 1951. Since 1949, the industry's passenger-miles have jumped 117%, NWA's only 73%. The NWA salesmen intend to narrow the gap.

James Mariner, v.p. of sales, and his staff told the recent systemwide sales meeting in Minneapolis that 1954's $65 million is to come from:

Passengers, $51 million (up 6% from '53); mail, $7,750,000 (same as '53); express, $850,000 (4%); freight, $4.5 million (4%); excess baggage, charters, miscellaneous, $900,000 (6%).

The conference heard that:

Sales department expense last year was 11.4¢ out of every non-mail revenue dollar produced, down from 11.6¢ and 11.7¢ in '52 and '51, respectively, with further improvement expected this year.

In the last five years, non-mail revenue has increased 74%, with a gain of only 20% in local sales office expense (general sales office administrative expense increased 97% in the same period, mostly due to heavier advertising expenditures and commissions on passenger and cargo revenues).

Reservations department's productivity is increasing. In '53, 8.7 domestic passengers were boarded per reservations agent per day against 8.4 in '52; the '54 goal is 10.5. System reservations salary expense was 87¢ per passenger boarded, compared with 95¢; total reservations salary costs amounted to 2¢ of each $1 of passenger revenue, against 2.13¢.

There'll be heavy stress this year on improving agency and interline revenues, which already account for $20 million or 41% of system passenger revenues. Business from travel agents increased 13% last year, interline 22.4%. United Air Lines gave NWA $2,692,000 in revenue, and American,

TWA, Eastern and Pan American were all over $1 million.

Fifteen tour operators are in the '54 tour program, and promotion of round-the-world tours, both first-class and tourists, will be stepped up. Effort will be made to sell European-bound travelers on continuing round-the-world. The Orient is to be given a big sales push in April, with national ads, window displays, etc.

The '54 goal on convention sales is $500,000, against $135,000 last year.

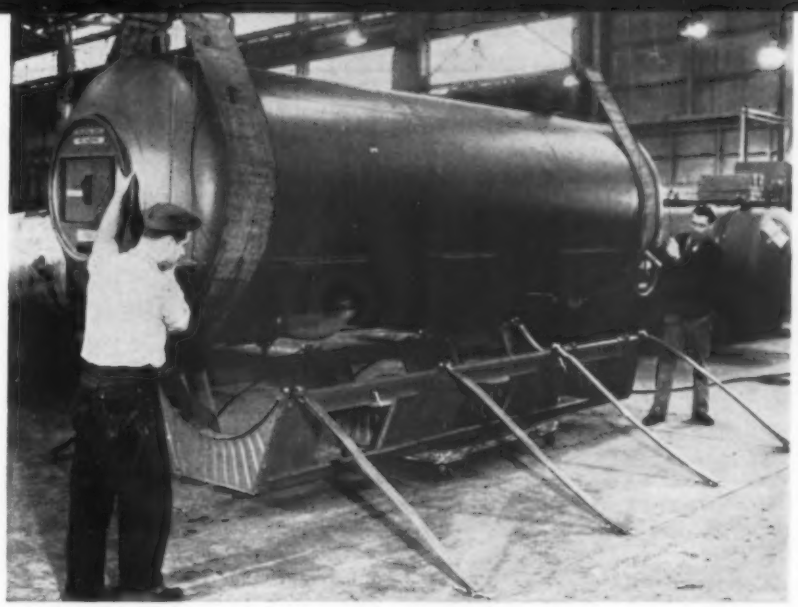
New advertising development this year will see $100,000 out of the ad budget "decentralized." Part of the $100,000 will be allocated to each NWA region so that local sales managers will be in a position to advertise in special local situations. Funds will be controlled by the regional managers; allocations are eastern region, $29,800; central, $27,500; western, $34,000; Orient, $8,700.

NWA this year changed completely the format of its sales conference. First day of the three-day meeting was given over to the local managers, each of whom talked 10 minutes on his '53 results and his '54 expectations. General office staff took a day and a half to discuss upcoming programs, and the last afternoon was devoted to individual conferences between local managers and headquarters personnel on specific problems.

Noteworthy in sales conference technique is NWA's method of insuring that meetings start on time and remain on schedule. Every manager who was on time for a session received a numbered stub—a "chance" on a prize at the final banquet. Those who were not on time (morning sessions opened at 7:55 a.m.) were not admitted to the room until the coffee break. Speakers were warned as they approached their time limits, and were cut off "on the button."

Another innovation: several days before the meeting, each manager was instructed to fill out all documents required to travel from the U.S. to each country served by NWA. These were turned in at the conference; until they were correct the manager did not receive his "passport" to attend the banquet. The banquet, incidentally, was a "flight to the Orient"—the regular international dinner served on trays by stewardesses, in-flight announcements by the steward, etc.

During the past several months, NWA has gone to considerable expense to better equip its sales force for the job ahead. It purchased the "System for Selling" from Sales and Management Institute, New York, and has put all outside sales personnel through the complete course. It's looking for tangible results in '54. • • •



Fuel tank for Boeing KC-97 Stratofreighter carries 1800 gallons for refueling USAF jets during flight. Big storage tank is built by Goodyear Aircraft.

Technical Literature

AIRCRAFT FASTENERS: Catalog and engineer's manual has been compiled by Aircraft Fastener Div., Scovill Manufacturing Co., 99 Mill St., Waterbury 20, Conn., to provide data on its line of Paneloc aircraft fasteners used to hold together two overlapping metal sheets under tension, shear, and vibration.

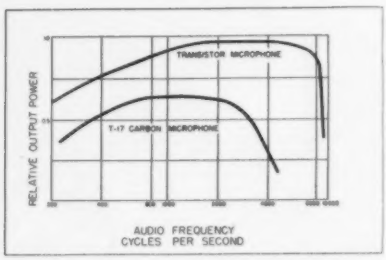
HYBRID JUNCTIONS: Bulletin HJ-1 describes features and characteristics of short slot hybrid junctions for high frequency radar and communications. Microwave Development Laboratories, Inc., 220 Grove St., Waltham 54, Mass.

FARNBOROUGH FILM: A 20-minute, 16 mm sound film in color, of the air show held in Farnborough, England. Included are engine displays and flight exhibitions. Meletron Corp., 950 No. Highland Ave., Los Angeles 38, Calif.

POTENTIOMETER: Data sheet #508 presents technical data on a new diaphragm bellows-type differential pressure potentiometer in standard ranges from 0-1 to 0-31 psi. Bourns Laboratories, 6135 Magnolia Ave., Riverside, Calif. (Dept. NL).

Briefing session for the Aviation Subcommittee of the Senate Interstate Commerce Committee brings together aviation notables. At right, Senator Dwight Griswold (R. Neb.) subcommittee chairman; others left to right: CAB Chairman Chan Gurney, CAB Member Josh Lee, and Senator James Duff (R., Penna.), member of the new permanent subcommittee.

New Products



TRANSISTOR PREAMPLIFIER (at left) fits into mouthpiece of handset or microphone. Graph at right compares output of new Remler unit with T-17 carbon microphone.

Microphone. A new transistorized aircraft microphone, which gives promise of appreciable improvement in the quality of air-ground communication reception and is designed to be directly substituted into current carbon microphone circuits, has been placed into production by Remler, Ltd., of San Francisco, Calif.

The new unit combines the high fidelity features of a rugged magnetic variable-reluctance type of microphone with an efficient high-gain transistor preamplifier. It has already seen close to 1000 hours of flight testing in actual service on a major airline.

At Remler the new microphone has been operated continuously for over 16 weeks of rigid life testing without any falling off in performance. In environmental tests operation was reportedly not affected after exposure to —60° F. temperatures for five hours; + 160° F. for three hours; + 125° F. for three hours; simulated altitude of 50,000 feet; and relative humidity of 96%-100% at + 122° F. for 96 hours.

Aside from its major benefits to be realized in air-to-ground communications, the new microphone will also improve intelligibility of public address systems, both in aircraft and airport passenger terminals, Remler officials believe.

Specifications include: **Output:** 0.778 vrms at 100 dynes/sq.cm.; **matched impedance:** 150 ohms, ± 1 db 50 to 500 ohms; **d-c supply load:** 1000 ohms between 5 and 35 volts d-c; **frequency response:** ± 6 db 500 to 6000 cps, 6 db per octave fall-off from 500 cps.

Address **Remler, Ltd.,** Dept. AAP, 2101 Bryant St., San Francisco 10, Calif.

Regulator. A new constant current regulator for high-speed switching of airport runway lights which prevents the lights from "blacking out" when the brightness control is operated is being marketed by the Hevi Duty Electric Co.

A four kilowatt, static type unit, the

24 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS
THAI AIRWAYS CO. LTD.
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to bring ultra-modern service to ancient trade routes
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CURTISS-WRIGHT
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Aircraft Engines

The old Roman god Janus lives today in servo mechanisms, instruments, and controls which take past information and use it to guide the future —much as Janus faced backward and forward in time, to symbolize past and future.

time in your hands

Controlled, predictable flight depends upon data concerning the immediate past of a flight, as well as navigational information for the course ahead. Time is literally in your hands with Kollsman products.

Today our activities encompass four fields:

AIRCRAFT INSTRUMENTS AND CONTROLS
OPTICAL PARTS AND DEVICES
MINIATURE AC MOTORS
RADIO COMMUNICATIONS AND NAVIGATION EQUIPMENT

Our manufacturing and research facilities . . . our skills and talents, are available to those seeking solutions to instrumentation and control problems.

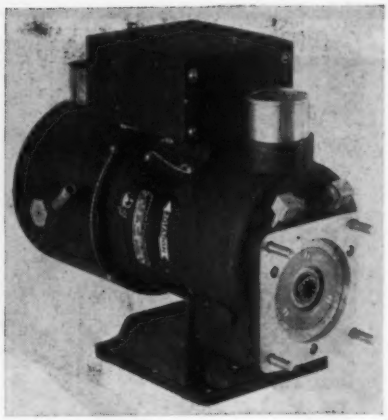
kollsman INSTRUMENT CORP.

ELMHURST, NEW YORK • GLENDALE, CALIFORNIA • SUBSIDIARY OF *Standard* COIL PRODUCTS CO. INC.

new regulator will operate when 30% of the lights are out without building up excessive output currents.

The design emphasizes rugged construction without complicated circuitry and mechanical devices, thereby keeping maintenance to a minimum. Unit operates from 208- to 250-volt power supply. An air-cooled design permits installation in control towers, vaults, or unused hangar or office space.

Address: Hevi Duty Electric Co., Dept. AAP, Milwaukee 1, Wisc.



Pump Motor. The General Electric Co. has announced production of a new 3½ horsepower hydraulic pump motor which is rated as 7500 rpm and is designed to supply hydraulic power in jet bombers for control of aircraft tail assemblies. In wing locations it serves as a standby source of power when a jet engine is the primary source.

Feature of the new motor is an air-through design which uses a built-in blower to draw outside air through the motor brushes and windings and expel it from the pulley-end stack. The air-through design is said to be more effective than the previous air-over arrangement in that it brings air directly to the armature and commutator, the primary sources of heat.

The new G-E unit circulates air from minus 65° F. to plus 135° F. at altitudes approaching 50,000 feet.

Address: General Electric Co., Dept. AAP, Schenectady 5, N. Y.

In Electronics

Voltage Sensitometer. For protection of aircraft electronic equipment or controls which are sensitive to voltage fluctuations or low voltage malfunctioning. The service will sense a predetermined voltage drop and either lock or shut off the equipment being protected.

When power is restored and an established delay period for stabilization of the equipment passes, the sensitometer unlocks or restores the protected equipment to operation. Unit is being used by General Electric Co. in the J47 jet engine fuel control system in the North American F-86D Sabrejet.

Address: Electronic Specialty Co., Dept. AAP, 3456 Glendale Blvd., Los Angeles 39, Calif.

Filter. A new filter assembly, type F-12, designed for use with any signal generator which provides a 90/150 cycle modulation for airborne VHF glide slope or localizer receiver testing. Unit permits checking accuracy of the modulation levels provided by the generator.

The F-12 consists of two pairs of matched 90 and 150 cps filters as a means for self-checking. Provision is included for switching the demodulated signal generator output to any of the four filters.

Address: Aircraft Radio Corp., Dept. AAP, Boonton, N. J.

Tube Shields. Now in production for all sizes of seven- and nine-pin miniature electron tubes, a new design shield features improved cooling. Metal spring fingers of the shield which rest on the tube provide direct contact between tube, shield, and chassis to carry off generated heat. In side-by-side tests with JAN shielded tubes and unshielded units, new IERC shield operated 90° cooler than highest recorded tube temperature and 47° cooler than bare tube.

Address: International Electronic Research Corp., Dept. AAP, 175 W. Magnolia Blvd., Burbank, Calif.

Model

PERFORMANCE!

We matched Clair Smith with Eclipse-Pioneer's 14608 electrical attitude horizon indicator and 12143 inverter because seldom have we seen three neater or more reliable packages. Clair's sunnytime raiment helps make the point that the weather's always more inviting if you have this electrical gyro to supplement vacuum instruments in your flying machine. It permits 360-degree maneuvers without tumbling, has a 10-second fast-erection device, and a power failure warning flag. The inverter (250 VA output, single or 3-phase) weighs but 13 lbs., also may be used as a spare power source for radio gear. Contact us for immediate delivery and for Eclipse-Pioneer authorized installation and service. As for Miss Smith, she's 21, 5'7", 115 lbs., blonde, and green-eyed.

PHOTO CREDITS

Cover—Chance Vought; 13—Convair; 14—Boeing; 15—Dayton Daily News; 16—Convair; 17—North American; 20—Georgetown; 61—Kennedy; 65—ICAO.

2,000 HOURS

between engine overhauls

DELTA-C & S

FOR THE FIRST TIME in the history of the industry, the CAA has approved a 2,000-hour engine overhaul period. This authority has now been given to Delta—C & S for its Curtiss-Wright C18BD1 engines used in its Lockheed Constellations.

This new world standard of engine reliability is a tribute to the engine overhaul, line maintenance and flight personnel of Delta—C & S.

AeroShell Oil 120 is used exclusively in these Delta—C & S engines.

SHELL OIL COMPANY

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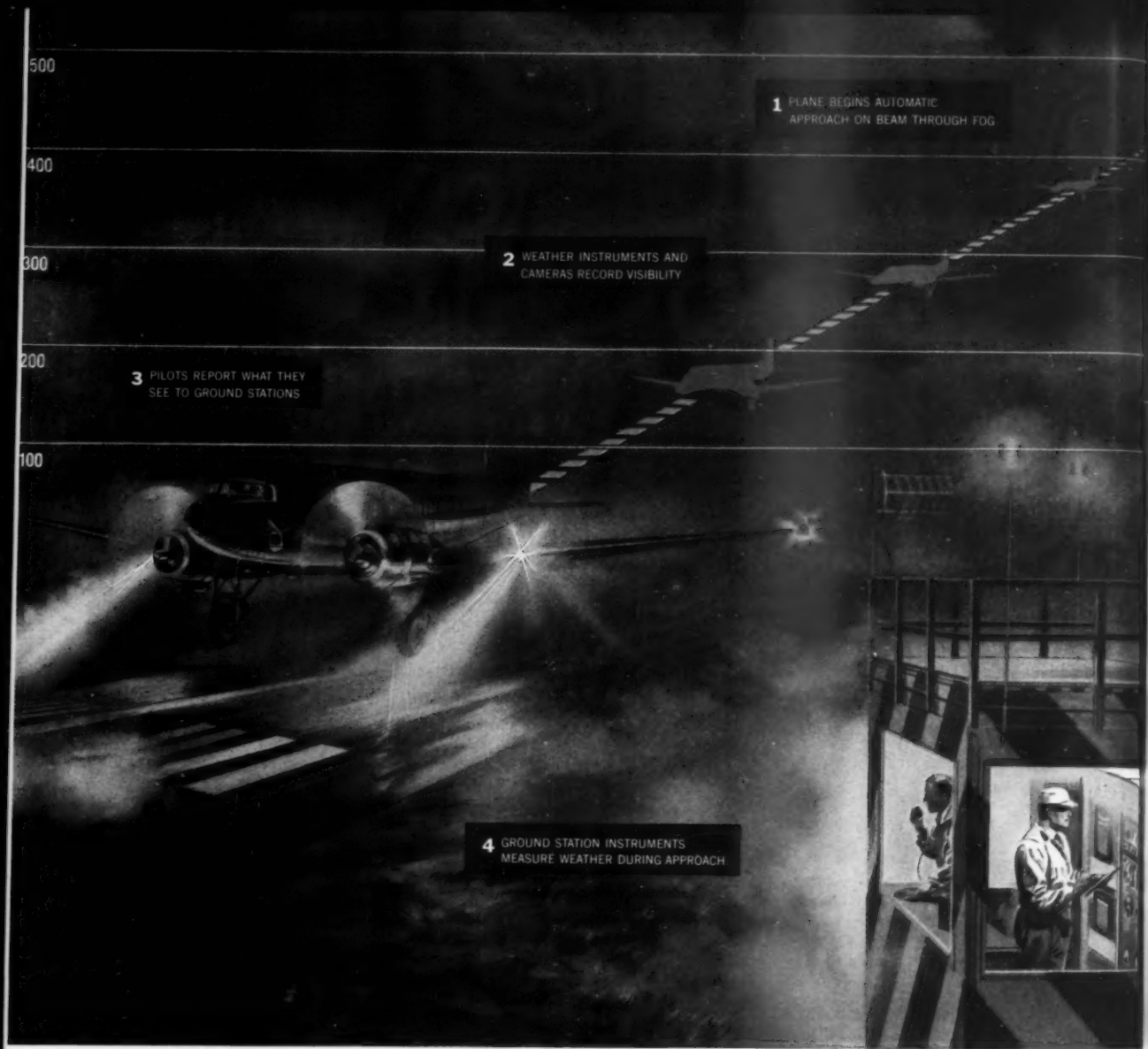
500
400
300
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1 PLANE BEGINS AUTOMATIC APPROACH ON BEAM THROUGH FOG
2 WEATHER INSTRUMENTS AND CAMERAS RECORD VISIBILITY
3 PILOTS REPORT WHAT THEY SEE TO GROUND STATIONS
4 GROUND STATION INSTRUMENTS MEASURE WEATHER DURING APPROACH

Flying Lab makes 500 Landing Approaches in "Pea Soup"

THE STORY BEHIND THE STORY:

■ IF YOU'VE BEEN a passenger in a plane "stacked" above a fogged-in airport—or if you've been the pilot at the controls—you were certainly interested in headlines like the above appearing in newspapers a few months ago.

■ Behind those headlines is the dramatic story of men flying when "even the birds are walking," making landing approaches over and over again, to make your future landings safer in bad weather.

■ Working with the Air Navigation Development Board and the U. S. Weather Bureau, Sperry flight research personnel have completed 500 bad weather landing approaches in a flying laboratory equipped with specialized instruments. In flight, both manual and automatic recordings are made of conditions encountered during the final 500 feet of descent.

■ On the ground, trained observers report what they see, and monitor automatic instruments which measure ceiling and visibility conditions existing in the runway approach zone. Synchronized and analyzed, these records reveal the accuracy of the instruments and establish a wealth of information so pilots will know what weather to expect along the line of descent.

■ Because of its many years of experience in low ceiling approaches, Sperry was selected by the government to make the weather measurement study. This project is typical of the exacting flight research which is continuous at Sperry—flight research not only to perfect Sperry instruments and controls, but to advance the operational efficiency of both commercial and military aircraft.

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People

MANUFACTURING

F. T. Smye and W. R. McLachlan have been appointed vice presidents and general managers of A. V. Roe Canada Ltd.'s Aircraft Division and Gas Turbine Division, respectively.

Charles J. Breitwiesser, director of engineering and manager of the General Development and Engineering Division of Lear, Inc., has been elected a vice president of the corporation.

Ralph E. Jennings, Doman Helicopters Inc.'s executive vice president, has been elected to the firm's board of directors.

George Friedl, Jr., has been promoted from works manager to vice president in charge of manufacturing for Link Aviation, Inc.

Frederick H. Rohr, Jr., has been elected assistant vice president of Rohr Aircraft Corp.

Rohr

Buchhold

Theodor Buchhold, formerly chief of the guidance and control branch of the Guided Missile Development Division of Redstone Arsenal, has joined Ford Instrument Co., Division of the Sperry Corp., as staff consultant to the vice president for engineering.

Frank X. Lamb, chief engineer, and **Roswell W. Gilbert,** director of research for the Weston Electrical Instrument Corp., have been named vice president and assistant to the president, respectively. Each of the men will continue his present work, but will acquire additional responsibilities.

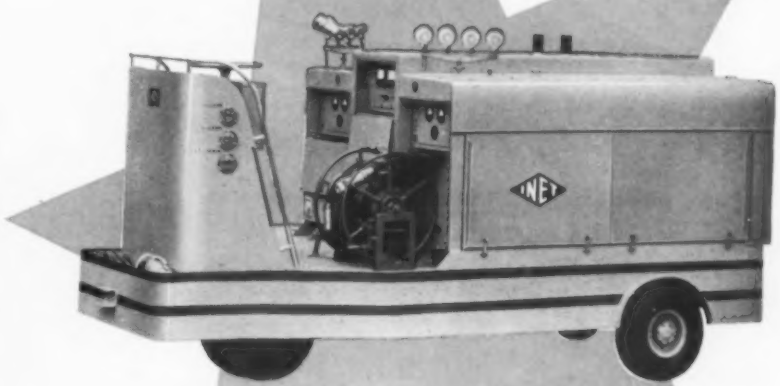
F. H. Mott has been elected administrative vice president in charge of all Eaton Manufacturing Co. plants in Michigan, and **R. H. Daisley,** formerly vice president of manufacturing, has been named vice president in charge of all Eaton plants in Ohio, Kenosha, Wis., and London, Ont. Accompanying the change in administrative vice presidents at Eaton was the election of **R. E. Fisher** to be vice president in charge of sales for the corporation.

John S. Gillespie, who joined Airwork Corporation in 1947 as a stock clerk, has recently been elected vice president of sales of the New Jersey concern.

AIRLINES

Nicholas Boratynski, formerly director of design, buildings, and airports for United Air Lines, has been appointed director of industrial engineer-

Modern GROUND POWER FOR Modern AIRCRAFT



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Units embody the famous DUPY* Load Sensitive Governor which saves up to 30% of fuel required by fixed-speed equipment. All electrical components are the best obtainable.

GENERATOR RATINGS: 22.5 to 60 KW; 750 to 2000 AMPS; 28.5 VDC. Trailer types are also available.

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POSTAL STATION "L" TORONTO ONTARIO

ing for the Los Angeles architectural firm of Pereira and Luckman.

Jack Ballard has been named to head Scandinavian Airlines System's recently expanded Seattle sales office, as district sales manager, and **Arne Ewald** has been appointed manager of Scandinavian sales. Both men will work out of the same office, 3308 White Building, Seattle.

Tom Hall Miller has resigned as assistant to the president of North American Aircoach System, Inc.

W. L. Fabro has been named director of passenger services and **J. L. McLellan** has been named director of station services in a recent re-organization of Trans-Canada Air Lines' passenger and station services group.

Joseph L. Lewis, one of Mohawk Airlines' senior captains, has been named chief pilot of the carrier.

• **Wilbur L. Morrison,** Pan American World Airways. Executive vice president, Latin American Division. Miami. 25 years.

• **Thomas A. Reid,** Pan American World Airways. Supervisor of warranty claims, Miami. 25 years.

• **P. A. Vance,** American Airlines. Captain, Fort Worth. 25 years.

• **J. H. Burns,** American Airlines. Captain, San Francisco. 25 years.

• **T. J. Lee,** American Airlines. Captain, Fort Worth. 25 years.

• **E. R. Merrett,** American Airlines. Operations supervisor, Fort Worth. 25 years.

• **W. H. Miller,** American Airlines. Regional operations and maintenance director, New York. 25 years.

• **H. V. Woodall,** American Airlines. Captain, Fort Worth. 25 years.

• **Frank R. Powers,** Pan American World Airways. Regional director, Latin American Division, Miami. 25 years.

• **Frederic Muller,** Eclipse-Pioneer Division of Bendix Aviation Corp. Subcontract engineering, Teterboro. 28 years.

• **Martin Neuner,** Eclipse-Pioneer Division of Bendix Aviation Corp. Electrical accessory engineering. Teterboro. 27 years.

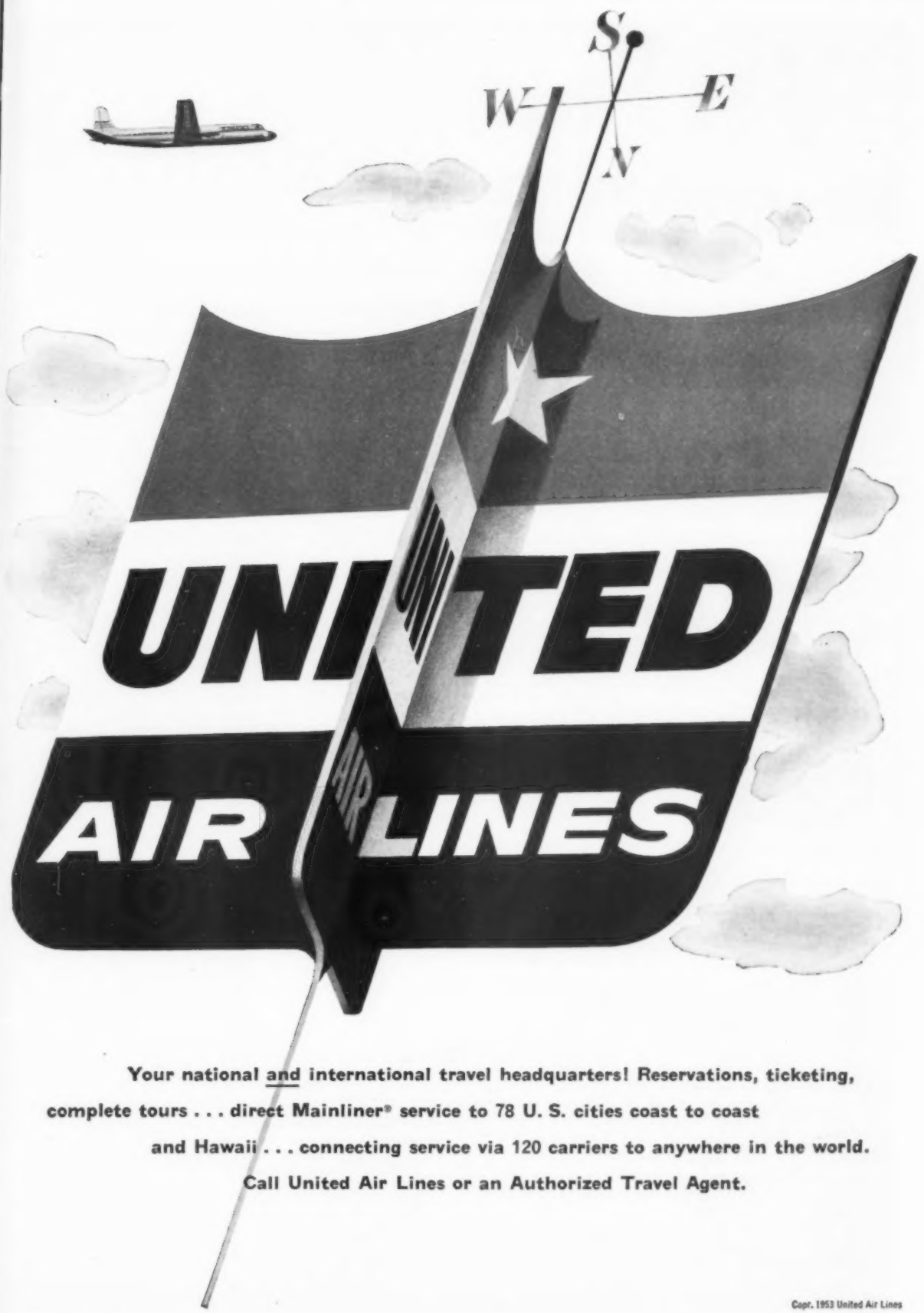
• **William Stokey,** Eclipse-Pioneer Division of Bendix Aviation Corp. Instrument machine shop foreman. 26 years.

• **Alexander Getty,** Eclipse-Pioneer Division of Bendix Aviation Corp. Milling department, Teterboro. 25 years.

• **Lloyd R. Moore,** Pan American-Grace Airways. Pilot-instructor, Lima. 25 years.

• **Nels Larson,** Northwest Orient Airlines. Crew chief, St. Paul. 25 years.

• **Roy E. Keeler,** Pan American World Airways. Captain, Miami. 25 years.



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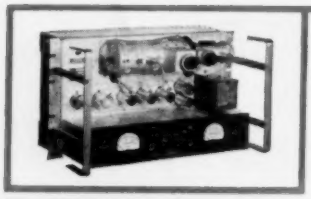
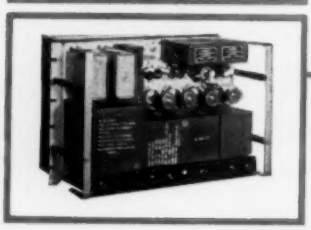
VHF for air-ground communications?

dependable . . . flexible . . . versatile . . .
COLLINS 242F-3 GROUND STATION TRANSMITTER
for complete VHF Coverage . . . local or remote

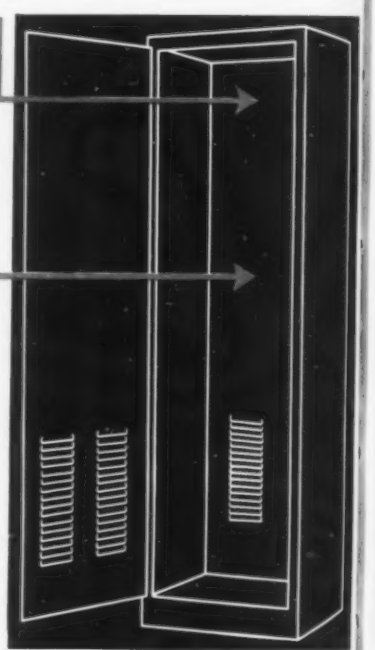
108 to 152 mc. Rated at 50 watts RF output into 52 ohms. Normally supplied with power supply/modulator unit and one RF unit. Extra RF units (for non-simultaneous operation) can be added as required to a common power supply/modulator. Each RF unit has provision for two crystals and is equipped with a selector switch allowing a pair of channel frequencies up to 0.3% separation without retuning. Up to four RF units (eight channel frequencies) can be remotely operated by the Type 278E-1 Remote Control Unit. An unlimited number of RF units can be locally controlled. All units designed for 19″ rack mounting. Power requirements: 115/230 volts, 50/60 cps, single phase. 800 watts transmit, 100 watts standby.



RF UNIT — Tubes, transformers, and controls are accessible from the front. Under-chassis wiring is accessible from the rear by the removal of the protective cover. Vertical type chassis construction is employed with the tubes and transformers mounted horizontally. There is a sub-chassis for the oscillator, frequency multiplier and driver, and a sub-assembly for the final amplifier. This type of construction allows nearly ideal heat dissipation thus providing cooler running equipment for longer service life.



POWER SUPPLY/MODULATOR — As in the RF unit, tubes and controls are accessible from the front. Under-chassis wiring is accessible from the rear after removal of the protective cover. Vertical type chassis construction is employed with tubes and transformers mounted horizontally.



51M-7 VHF RECEIVER — COMPANION to 242F Transmitters

Frequency Range: 118.0 to 152.0 mc.
Sensitivity: Signal to noise ratio for a 5 microvolt input signal modulated 30% is not less than 10 db.*
Selectivity: Bandwidth at 6 db attenuation is not less than 45 kc. Bandwidth at 60 db attenuation is not more than 140 kc.
Automatic Volume Control: Audio output will not vary more than 3 db when the input signal is varied from 5 to 100,000 microvolts.
Input Circuit: Impedance 52 ohms unbalanced.
Output Circuit: Impedance 600 ohms split secondary winding with 4 ohm tap for speaker voice coil operation.
Output Level: Not less than 2.0 watts for 5 microvolt input signal modulated 30% at 1000 cps.
Audio Frequency Response: Audio output from 300 to 3500 cps does not vary more than 3 db from audio output at 1000 cps.
Audio Distortion: Does not exceed 10% when measured at 2.0 watts output with signal modulated 30% at 1000 cps.
Spurious Responses: All spurious responses are attenuated at least 90 db with respect to desired signal.
Ambient Temperature Range: −40°C. to +60°C.
Ambient Humidity Range: 0 to 95% relative humidity.
Altitude: Sea level to 10,000 feet.
Frequency Stability: 0.005% over the specified service conditions.
Power Source: 115 v. or 230 v. 50-60 single-phase a-c.
Dimensions: Width 19″, height 8¾″, depth 10¾″.
Weight: Approx. 26 lbs.
*Input signals specified are signal voltages in series with 52 ohms, measured with open circuit.

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When your problem is the selection of ground station VHF equipment . . . consider Collins quality, versatility and dependability

FOR EXTRA POWER 200 WATT 242F-2 Transmitter

Ambient Temperature Range: —40°C to +60°C.

Ambient Humidity Range: 0 to 90% relative humidity.

Altitude: Sea level up to 7000 feet.

Power Source: The unit operates from 105-115/210-230 v ac 50/60 cycles, single phase with a standby power requirement of 200 watts and a transmit power requirement of 1300 watts. It operates with a power factor of 90% lagging. The unit can be operated from 115 v ac with two primary windings on transformer connected in parallel or on 230 v ac with these windings in series. Low voltage taps are also provided on all transformers.

Frequency Range: 108 to 152 megacycles.

Channels: Single channel transmitter with desired output frequency determined by crystal frequency selection. A second frequency can be installed without retuning with the requirement that the channel separation shall not be more than 0.3% of operating frequency. This spacing will reduce power no greater than 0.5 db.

Frequency Stability: ± 0.001%.

Harmonics and Other Spurious Production: All spurious radiation, including harmonics, are at least 80 db below carrier level when used with the 35D-1 filter supplied with transmitter.

Audio Input: 100 ohm carbon microphone with push-to-talk switch or a high impedance dynamic microphone with push-to-talk switch. Dynamic microphone is recommended because of superior frequency response.

Modulation: At least 90% modulation is obtained from 300 to 3750 cps or 300 to 10,000 cps depending on application.

Audio Frequency Response: Flat to ± 3 db with respect to 1000 cps over a range of 300 to 3750 cps. This is measured at a level for 90% modulation without clipping.

Power Output: At least 200 watts is delivered over frequency limit and service conditions when operating into a 52 ohm resistive load.

Carrier Shift: Power output decreases less than 10% over the range of 0 to 90% modulation.

Output Impedance: 52 ohms.

Noise Level: Better than 40 db below 90% modulation without clipping.

RF Unit: 19" wide, 12¼" high and 12" deep.
Modulator Unit: 19" wide, 14" high and 12" deep.
RF Selector Unit: 19" wide, 7" high and 8" deep.
Filter and Bias Unit: 19" wide, 10½" high and 12" deep.

50 WATT 242F-3 VHF Ground-Station Transmitter

Ambient Temperature Range: —40°C to +60°C.

Ambient Humidity Range: 0 to 90% relative humidity.

Altitude: Sea level up to 7000 ft.

Power Source: The unit operates from 105-115/210-230 v ac, 50/60 cycles, single phase with a standby power of 100 watts and a full load transmit power requirement of 800 watts. It operates at a power factor of 90% lagging. The unit can be operated from 115 v ac with two primary windings on the transformer connected in parallel or on 230 v ac with these windings in series.

Frequency Range: 108 to 152 megacycles.

Channels: This is a single channel transmitter with desired output frequency determined by crystal frequency selection. A second channel is provided with the requirement that the channel separation shall not be more than 0.3% of operating frequency, without retuning.

Frequency Stability: The crystals utilized are mounted in a temperature stabilized oven so that a frequency stability of ± 0.001% is obtained under any natural combination of the service conditions.

Harmonics and Other Spurious Production: All spurious radiation, including harmonics, are at least 80 db below carrier level when used with the 35D-1 filter supplied with transmitter.

Modulation: High level amplitude modulation is obtained through use of a plate and screen modulation transformer. 90% modulation is obtained from 300 to 3750 cps, or 10,000 cps depending on application.

Power Output: At least 50 watts is delivered over frequency limit and service conditions when operating into a 52 ohms resistive load.

Carrier Shift: Less than 10%.

Output Impedance: 52 ohm.

Audio Input: A microphone input circuit is designed to operate from a carbon microphone or a dynamic high impedance microphone. A 600 ohm balanced audio line is also provided for remote operation.

Audio Frequency Response: The audio frequency response of the unit is flat to ± 3 db with respect to 1000 cps over a range of 300 to 3750 cps.

Audio Frequency Distortion: The audio frequency distortion is less than 10% with a modulation level of 90%.

Noise Level: Better than —40 db.

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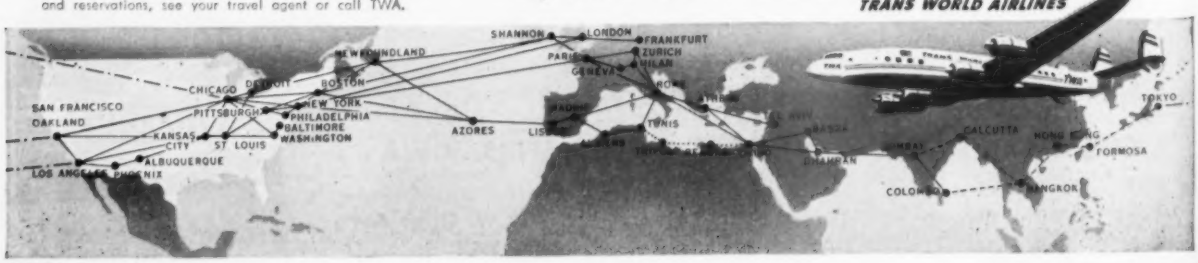

AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • *by Eric Bramley*

With a uniform 20% penalty system becoming effective this week on domestic air coach no-shows, we urge carriers to make the plan work better than they did the ill-fated system of several years ago. At that time, some lines started to fudge a little for competitive reasons, soon there was little enforcement, and the plan flopped. New system will be interesting to watch for one reason: if a penalty is collected every time it's supposed to be, and if the percentage of no-shows remains high, it will tend to prove the contention of some that many listings of no-shows are due to personnel error —error which can't be nulified by a penalty system.

•

Memo to American Airlines: Reference is made to the first paragraph of the "fact sheet" ("You'll Want to Know This About the DC-7 Flagship") that your stewardesses are handing to all DC-7 passengers. "This airplane," it states, "begins the first coast to coast, round trip, scheduled passenger service." How about running off a new batch, inserting the word "non-stop" somewhere in that sentence?

•

Airline Ground Transportation Association, which is becoming considerably more active and aggressive, asks why airport bus operators shouldn't carry cargo, express, and mail. It hints at a "two-fisted" campaign in that direction. Airline cargo experts have been invited to AGTA's Tampa convention April 11-12 to talk things over.

AGTA's arguments: operators have lots of unused cargo space in baggage compartments every day; equipment is idle part of each day when it could be hauling cargo and mail: "dead-head" trips could handle this traffic. "Thousands of tons of available cargo space . . . is being duplicated by other carriers . . . Why, when practically every other form of certificated transportation service is receiving mail pay, as well as cargo, are the ground . . . operators willing to sit back and let what is rightfully theirs go to someone else?"

Sales Organization

American Airlines made big industry news with its new organization plan (AMERICAN AVIATION, March 1). On the sales side, there's been some confusion among interested observers about how the new set-up works. **C. R. Smith,** AA president, explains as follows:

Sales department is headed by a senior vice president, **Charles Speers,** formerly assistant v.p. and general sales manager. "Customer service" has been separated from sales and placed under **R. E. S. Deichler,** v.p. of customer service (formerly v.p. of sales), who reports to **O. M. Mosier,** senior v.p. of operations.

Customer services scope "ranges through . . . reservations and ticketing, cabin standards and procedures, waiting rooms and lounges, ground transportation, cargo handling, Sky Chefs services, customer complaints, and other allied matters. This will be a staff department, which will establish the policy and standards by which American . . . will provide services to its customers."

Day-to-day supervision of these policies will be the line organization's responsibility, under regional operations directors, regional sales v.p.'s, field flight executives, and management representatives at city and station level.

With transfer of these functions, the sales department will be able to "concentrate more on the production of additional revenue, increased sales." Generally, downtown ticket and reservations offices will continue under administration of local sales executives; airport reservations offices under local operations executives. "But the policies for the . . . offices will be prescribed by the v.p.-customer services."

Sales, Traffic, Promotion

Load factor on American's DC-7's has been running at 73%, against 61% for the entire AA fleet . . . Major reduction in transcontinental **sleeper charge,** from $90 to $25, is planned by TWA for March 26 . . . Pan American, meeting Air Frances "Golden Parisian" competition, filed tariff with CAB for **$125 "stateroom" charge** on the Atlantic, effective March 15. PAA has been modifying Stratocruisers, adding rooms for the service . . . National plans to institute **family fare plan on its helicopters,** operating out of Miami . . .

Pan American last month used **closed circuit television network** to explain 1954 sales plans to its 2500 travel agents in 17 U. S. cities. First time TV has been used by the travel industry, PAA says. Company is aiming for 10% increase in sales over 1953 . . . Panagra is distributing to passengers a new **full-color route map** of South America, which folds into pocket size for easy handling. Produced by Jeppesen & Co., Denver . . . Capital Airlines will spend over **$800,000 on newspaper ads** this year, a 20% increase in lineage (120 papers in 75 cities).

Pioneer Air Lines' 1954 sales goals include 50% load factor on all flights, average of 10.5 passengers per plane-mile, 38.5 million passenger-miles, 20% increase in mail, 25% in freight, 10% in express

New concept in airline trip insurance permits preparation of policy in advance of arrival at airport where machine validates policy for amount of insurance desired. Unit was developed by Tele-Trip Policy Co., Inc., 420 Lexington Ave., New York, and is being installed at 75 major airports in U. S. for Mutual of Omaha insurance company.

Agreement with PO Reached on Rates

The possibility of Braniff, Capital, Delta, and Western losing mail tonnage and revenue to carriers with lower service rates was avoided early this month when agreement was reached on replacing their 53¢ rate with (a) a final 45¢ rate on segments competitive with the Big Four, National, and Northwest, and (b) a temporary 53¢ rate on non-competitive segments.

The four carriers faced diversion of mail under a proposed Post Office policy to ship airmail via the lowest-rated carriers.

Agreement on the revised structure was reached by the carriers, Post Office, and CAB staff on the opening day of hearings, which originally were ordered because no agreement could be reached. Because the "non-competitive" rate was continued as a temporary rate, however, the hearings went forward to determine a final rate for those segments.

CAB adopted terms of the agreement in an immediate rate order, retroactive to January 1, 1954, but Member Josh Lee reiterated, in a separate statement, his feeling that a formal industry-wide proceeding should be instituted, looking into both the structure and level of airline mail rates. An industry-wide investigation ordered by CAB on December 24, 1953, deals only with the "structure" and not the level of the rates.

Meanwhile, at the hearings which were held before Examiner William J. Madden, CAB's Bureau of Air Operations recommended establishment of a 55¢ final rate for the non-competitive routes of the four carriers.

According to exhibits submitted, the carriers which had previously received 53¢ under a single rate would average as follows under a combination 45¢-55¢ rate structure: Braniff—52.66¢; Capital—46.80¢; Delta—51.67¢; and Western—50¢. Board's staff estimated this would save the PO approximately $252,000 annually.

Non-Sked Urges Firms to Write Ike

An intensive campaign under which private non-aviation firms would write or wire President Eisenhower supporting North American Airlines' bid for permanent operating rights was launched by the carrier last month.

Under the program, which also is aimed at CAB enforcement proceedings now in progress, sample letters and wires were furnished the firms for use in preparing their communications to the President.

The request letter to those firms was dated February 17, 1954, was on stationary of North American Airlines, Inc., and was signed by "H. Peterson, Secretary."

Among statements contained in the sample letters furnished were the following:

"When the Republicans were elected with your leadership, many of us felt there would be considerable improvement with respect to continued government interference with certain segments of our economy. One of these in which I have always had a considerable interest was air transportation. The Civil Aeronautics Board, in my opinion, ever since it was organized under the New Deal administration, has had a fairly shabby record."

"I am behind your Administration 100% and want to continue to be so, but I think it is time that something should be done about the Civil Aeronautics Board and its obvious favoritism against free enterprise."

Also, a caption on a sample telegram reads: "The more telegrams of this kind the better, preferably from Republicans."

CAB MISCELLANY

Northwest Airlines has told CAB it favors the present "fixed-rate" mail rate structure as opposed to "multi-element" structure proposals of various other lines.

Ozark Airlines has applied for authority to suspend service at Alton-Wood River, Ill.

Pan American World Airways has served notice it will withdraw from consolidated IATA tariffs on April 1; KLM will take similar action October 1.

European-American Airlines renewed its bid for reopening the record of the Trans-Atlantic Cargo Case to air charges contained in a court proceeding now in progress involving Seaboard & Western Airlines.

United Air Lines and Delta-C&S Air Lines urge denial of U.S. Airlines' bid to transport surface mail at special rates.

CAB NEWS

AS OF NOW . . .

The so-called **Mexico City Exemption Case** in which a CAB exemption authorizing American Airlines to fly non-stop New York-Mexico City was stayed by the U. S. Court of Appeals, will be "argued on the merits" before the Court in mid-April. American is still negotiating with Mexico for necessary authority, but meanwhile, can't start the service, at least until the Court acts.

Hearings in the **North American Airlines Enforcement Case** moved to California on March 10, for about five weeks during which about 49 subpoenaed persons will appear as witnesses for CAB's Compliance Office. After much delay, the hearings got going in Washington late last month.

The expedited procedure ordered by CAB in the **Large Irregular Air Carrier Investigation** promises an early end to hearings in the case, possibly by May or June. That would set the proceeding up for a tentative decision by the Board but further hearings may be required after such decision.

RECENT CAB DECISIONS

National Airlines turned down, by 3-2 vote, a request for production of CAB staff information which NAL says would show "undue delay" in CAB's handling of its final mail rate case for 1947-1952.

Chicago-Detroit Local Service Case expanded to include Ozark Airlines as potential transferee for certain intermediate American Airlines points; others now in case are Lake Central and North Central.

North Central Airlines' Segment 5 extended by exemption beyond March 27, expiration date, pending outcome of renewal investigation.

American Airlines' application for inclusion of Kansas City on its Routes 7 and 25 dismissed from Denver Service at American's request.

CAB CALENDAR

Mar. 16—Hearing in Aero Finance Corporation Enforcement Proceeding. Washington, D. C. Docket 5779.

Mar. 17—Hearing in North Central Airlines Segment 5 Renewal Case. Washington, D. C. Docket 6432.

Mar. 29—Hearing in Overseas Military Mail Tariff Investigation. Washington, D. C. Docket 6489.

Mar. 29—Hearing in Newport, Vermont Service Case. Washington, D. C. Docket 6207.

Apr. 5—Hearing in Cubana Foreign Permit Modification Case. Washington, D. C. Docket 6376 et al.

Apr. 12—Hearing in Chicago-Detroit Local Service Investigation. Tentative. Place to be announced. Docket 6411.

Apr. 26—Hearing in Continental-Pioneer Merger Case and Continental-Braniff Merger Investigation. Washington, D. C. Dockets 6457 & 6464.

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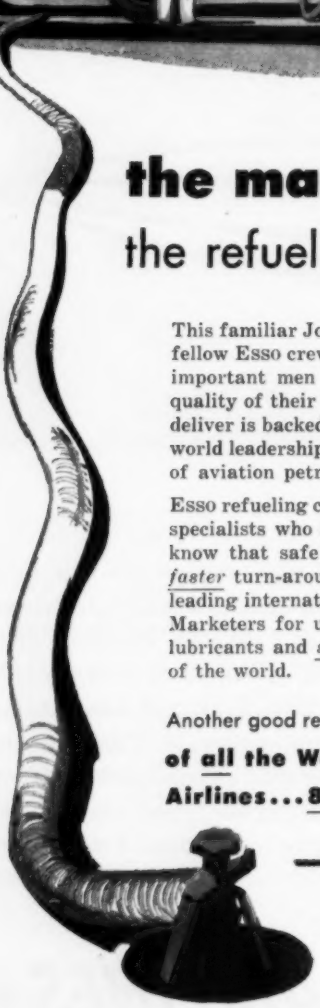
Esso refueling crew members are trained specialists who are proud of their jobs. They know that safe and efficient servicing means *faster* turn-around for aircraft. Operators of leading international airlines rely on Esso Marketers for uniform high quality of fuels, lubricants and *service* along the airways of the world.

Another good reason why:

of all the World's International Airlines...8 out of 10 use



ESSO

AVIATION PRODUCTS

INTERNATIONAL AVIATION

Edited by Anthony Vandyk

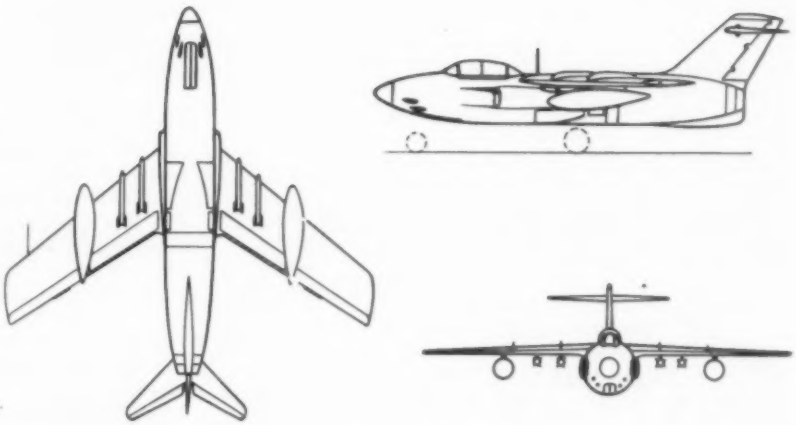
INTERCOM

Shed a tear for Swissair. Restrictionist practices by foreign governments and airlines have hit the Swiss flag carrier badly. Latest blow is Brazil's frowning on Swissair's plan to operate to South America in pool with SAS. The Brazilians say, in effect, operate alone, in pool with a Brazilian carrier, or not at all. Argentina doesn't want Swissair under any conditions, saying that Aerolineas Argentinas has enough foreign competition as things are.

Swissair's troubles aren't limited to South America. In North America the Canadians will not even let the airline carry traffic between Switzerland and Gander. The biggest difficulty regarding the trans-Atlantic route, however, is the refusal of Britain and France to let Swissair make traffic stops at London and Paris, even though Switzerland has accorded the British and French flag carriers full Fifth Freedom rights at Geneva and Zurich. Doubt as to whether the British and French would give traffic rights in their territories in Africa has made Swissair pessimistic about the value of reopening its route to Johannesburg which South Africa forced it to close several years ago.

The southern European countries also give Swissair a lot of trouble. The routes to Rome were approved by the Italian government only on condition that they would be operated in pool with Italian carriers. The Spanish government has refused permission for Swissair to serve Madrid. Moreover, Iberia has not let the Swiss airline put Convair 240's on the Geneva-Barcelona route and has restricted its capacity between these two points. The only European country which has in fact given Swissair full Fifth Freedom rights is Greece.

This is not a full list of Swissair's problems in the traffic rights field and no attempt has been made to explain why Switzerland seems to have been treated so badly by many nations. Swissair's difficulties, however, exemplify the problems with which the small countries' international airlines are having to contend in increasing volume. Similar stories could be written about KLM and SAS, to mention but two other carriers particularly hit by present-day restrictionism.



Russia's latest ground attack fighter is this Lavochkin design—the designation is not known. A squadron is in service in the Kiev area. Derived from the Lavochkin La-17, the new model grosses about 16,000 pounds and has a top speed of 560 to 590 mph. The two-place plane has four cannon (two 23-mm and two 37-mm) in the lower portion of the nose and four wing-mounted rockets. Radar is installed in the nose.

Agreement has been reached on continuing the ICAO North Atlantic weather station program. Effective July 1 the number of stations will be reduced from ten to nine, with the U.S. and Canada completely responsible for the four stations nearest their shores and the European states operating the other five stations. The revised program will result in a global reduction in operating charges of about $3,800,000 annually. The U.S. will save substantially, since from July 1 it will operate 10 instead of 14 ships (as a result of the elimination of Station H and European nations taking over responsibility for two ships at Station A between Iceland and Greenland). Moreover the new agreement provides a new system for financing the weather stations which takes into account non-aeronautical benefits (maritime, agricultural, etc.).

INTERNATIONAL AVIATION

MANUFACTURING

AUSTRALIA: Commonwealth Aircraft Corp. has designed a new trainer known as the Winjeel and plans are well advanced for its construction for the RAAF. It is a conventional-looking, low-wing, three-place (two side-by-side and one behind) monoplane powered by a P&W R-985 Wasp Junior. Speed range, 53 mph (landing) to 187 mph (top). Gross weight, 4235 pounds; empty weight, 3240 pounds; span, 31 ft. 9 in.; length, 29 ft. 4½ in.

FRANCE: Hurel Dubois HD 45 twin-jet (Avons) high-aspect-ratio-wing transport will be built as a private venture with some government support even though the jet transport officially sponsored by the French government is the SNCASE 210 Caravelle. Hurel Dubois HD 32 "DC-3 replacement" carries a payload of 12,125 pounds for 620 miles at 180 mph, according to latest figures.

Avions Marcel Dassault is developing a Mystere XX version of its swept-wing fighter design and is also working on two lightweight delta Dassault 550 fighters. The straight-wing Dassault Ouragan has been tested as a ground attack aircraft.

JAPAN: Toyo Aircraft Manufacturing Co. is reported to have received a small order for license-built Fletcher FD-25 Defenders from the Cambodian Air Force.

MILITARY

NORWAY: Norwegian Air Force has received the last of 15 Noorduyn Norseman single-engine utility transports formerly operated by the RCAF. They were made available under the NATO program.

NETHERLANDS: Re-equipment of the 300 combat-plane (150 Meteors and 150 F-84G's) Dutch Air Force with F-86's and F-84F's is under discussion. Particularly needed are F-86's to replace the Meteors until Fokker's Hunters come off the line (not until mid-1955 at the earliest).

BELGIUM: Belgian Air Force has received the first of its Percival Pembroke twin-engine transport/reconnaissance planes.

AIRLINES

GERMANY: One clause in the recently signed agreement between Luftag and the two British airline corporations stipulates that the British carriers will overhaul any British plane that the German airline might purchase. BEA and BOAC are expected to gain favorable traffic rights to and through Germany as a result of the agreement.

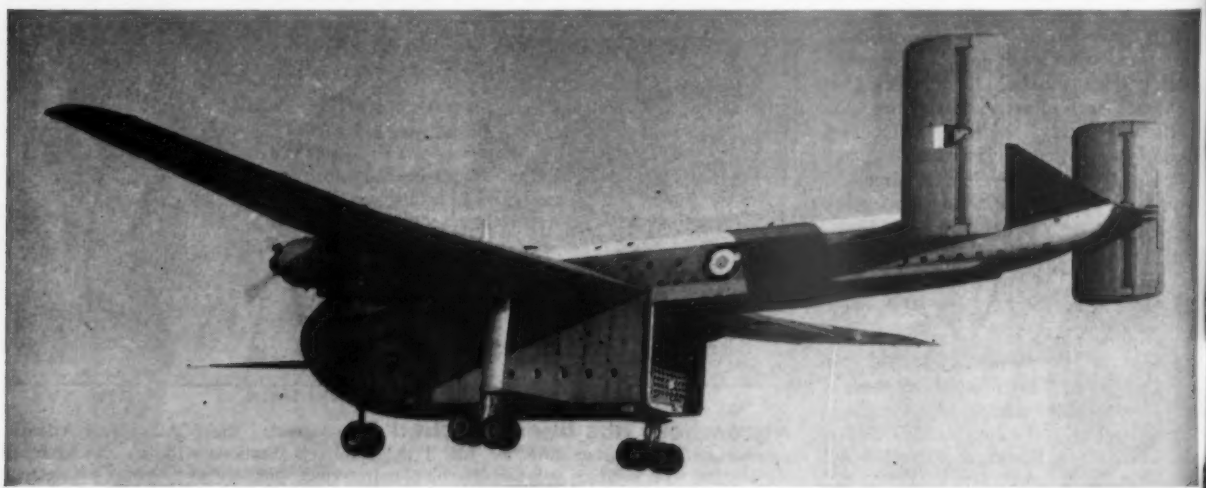
CANADA: Canadian Pacific Airlines may use its Comet II's on the Vancouver-Mexico City-Lima route before introducing them on the trans-Pacific run to Australia. CPA has substituted Convair 240's for DC-3's on the domestic Vancouver-Calgary route.

Trans-Canada Air Lines may reduce its domestic tourist fares to bring them to the level of U.S. transcontinental coach tariffs. TCA started domestic tourist service in February.

FRANCE: Henri Ziegler, president of Air France for several years, has quit the airline to take up a governmental appointment. He is not being replaced and chairman Max Hymans is taking over his functions.

BRITAIN: BOAC has started "paper" operations of Comet III's across the Atlantic in preparation for the proposed opening of jetliner service between London and New York in two or three years. A daily Comet flight is plotted by operations officers on each side of the Atlantic.

The P&O steamship company has entered the air transport field with the purchase by its subsidiary, the General Steam Navigation Co., of a majority holding in the Britavia group. Britavia owns Silver City Airways, which specializes in car ferry operations, and Aquila Airways, Britain's only commercial flying boat operator.



Flying without its clamshell doors is Blackburn & General Aircraft's Universal Freighter now known in Britain as the Beverley. Note strakes along the lower edges of the tail boom to keep the airflow from becoming too turbulent. Loads are usually mounted on the pallets resting on floor rollers. Dropping can either be by extractor parachute or by flying nose up, cutting the lashing, and letting gravity do the rest. Cluster chutes for heavy loads have standard 42-ft. diameter. The four-engine plane can operate at full load from 3000-ft. grass strips. In addition to the 6000-cu.ft. freight compartment the tailboom has seats for 42.

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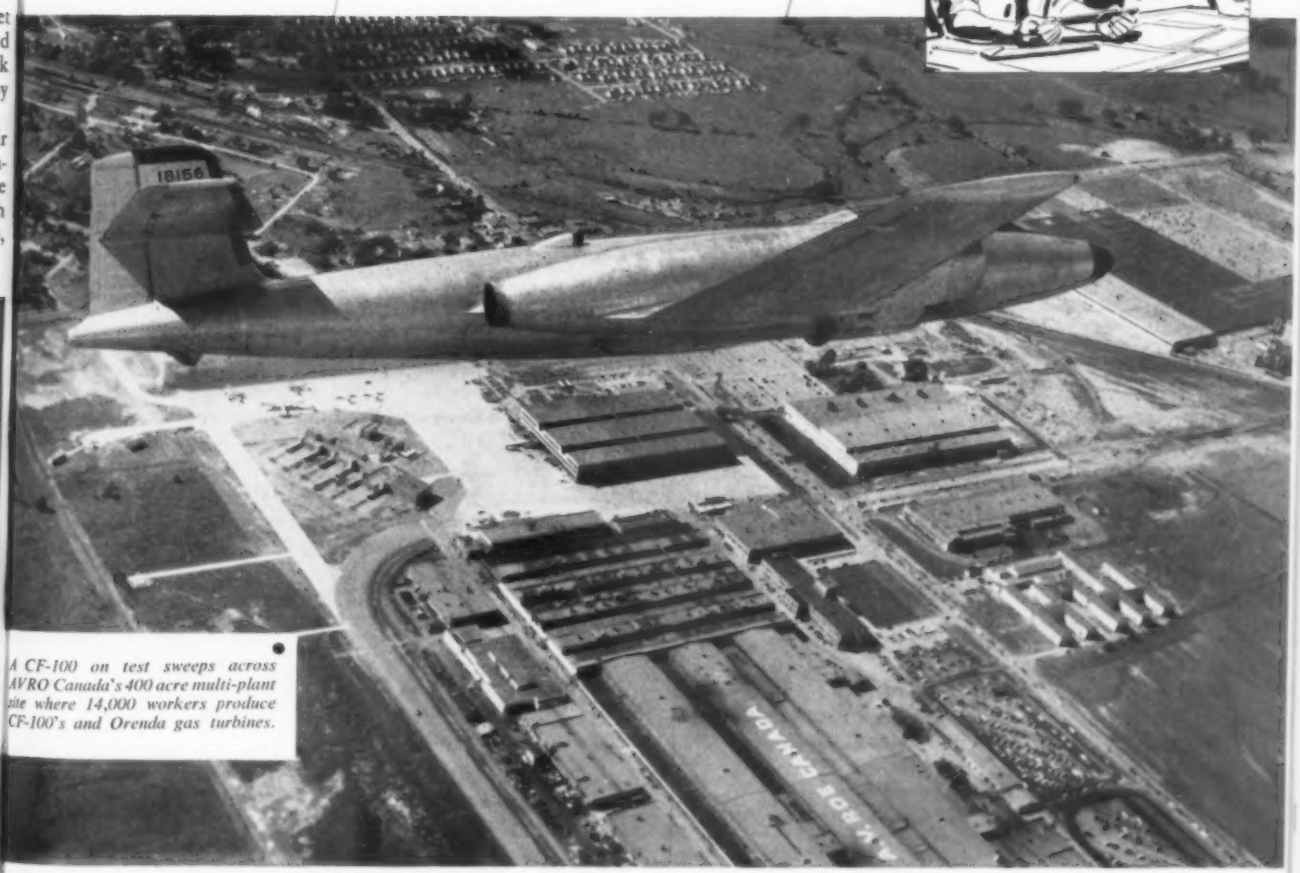

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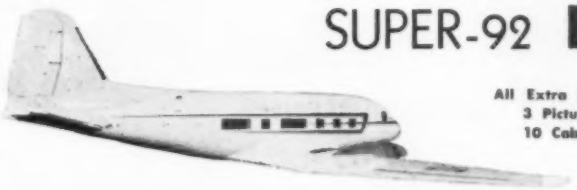

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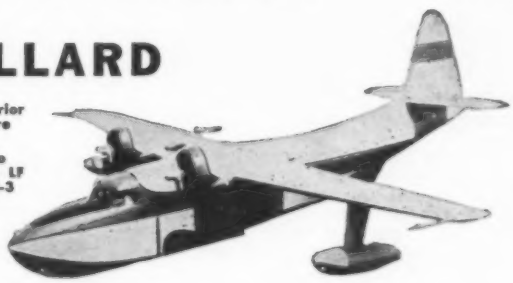

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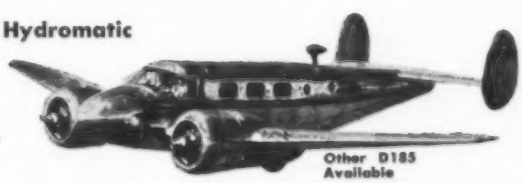

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En Route

WAYNE W. PARRISH

Algiers. Continuing the story of the Air France press trip last November to Paris, Algiers, and an oasis in the Sahara, our party was to spend one night in Algiers, the second night in Bou Saada, the oasis, and a third night in Algiers before returning to Paris.

The first night in Algiers was at the Aletti Hotel in the center of town overlooking the harbor. Not the best hotel, the Aletti is satisfactory and each room has a bath. A gambling casino, which I didn't see, is somewhere within the hotel. The food is pretty good. But the location guarantees plenty of traffic noise.

The best hotel is the St. George, higher up over the city in a very attractive tropical garden setting. We stayed there on returning from Bou Saada and I found it quite pleasant and quiet, with excellent food and a good bar.

Part of the local entertainment the first night consisted of a rather fancy dinner at the St. George at which we American visitors were the guests of what amounted to the local board of trade.

This was my first experience at hearing a large Arabian orchestra (about 20 pieces) and I'm afraid my ears aren't tuned to the right frequency. The music seemed to me to be monotonous and unending, without any semblance of melody, although the Arabs, some wearing fezzes, worked hard at it. I sat next to a French newspaper publisher and I discovered he didn't care for the native music either.

The Train Was Due. Early next morning we were wakened early and after breakfast in our rooms we piled into cars for the 155-mile drive south to Bou Saada. Off we went into the warm Algerian sunshine through the industrial section and on into the rich agricultural country which looked quite prosperous. After some 20 miles or so our motor caravan was drawn up short at a railroad crossing. The gates were down and there was already quite an accumulation of trucks, cars, and horses and wagons. Everybody else got out of their cars so we did, too.

Up at the crossing gates an argument was in progress. Seems that a train was due at that hour so the gateman, obeying strict orders, put down the gates. No train was in sight and there was no way of knowing whether it would even come along that day. But the schedule said it was due and the gatekeeper was doing his duty. If traffic was backed up for a mile in each direction he couldn't help it.

I'm not sure just what made the gatekeeper change his mind, probably a few Algerian francs, but after considerable delay he finally opened the gates and traffic proceeded. No telling when the train ever did come by.

All of which is not untypical of railroads in the byways of France, Africa, and other spots. The gatekeepers are told when trains are scheduled and down go the gates and the traffic just waits. In southern France you can usually persuade the gatekeeper, often a woman, to let you by, but the gate goes down fast as soon as your car gets across.

To Bou Saada. The road south from Algiers goes through the Atlas mountain range, which is not high at this point and continues through agricultural country which gradually thins out into desert. There are a few uninteresting towns, the principal one being Aumale, where we had lunch on the way back.

At least half the distance to Bou Saada is through dry, barren country, very much like New Mexico and Arizona. Some of it is very attractive. The population thins out, too, until there are only huts here and there. Large mesas are in the background and the soil becomes sandy.

The blacktopped highway was quite good. The French have done a very creditable job of developing Algeria and I was told the good highways extended far south of our objective.

After a few hours driving we came within sight of Bou Saada, population about 18,000, a town of earthen mud-colored one- and two-story houses built up alongside clusters of date palm trees the only greenery in a wide area. There is no airport and no railroad. There is a small French population, the remainder being Arabs.

There are two hotels, each adequate for the area, one being the Trans-Atlantique, and the other, where I stayed, the Hotel du Caid, pronounced something like Kaa-eed, meaning Arabian Chief. Each hotel is on the outskirts of the town, each has running water, some flush toilets, and clean beds.

Camels and Cars. The French are endeavouring to build up tourist traffic to Bou Saada and it isn't too bad a spot if you want to see an Arab community on the northern fringe of the Sahara. One hotel has a swimming pool. The food, everything considered, is pretty good. In view of the location where even a stick of wood is precious the accommodations are okey.

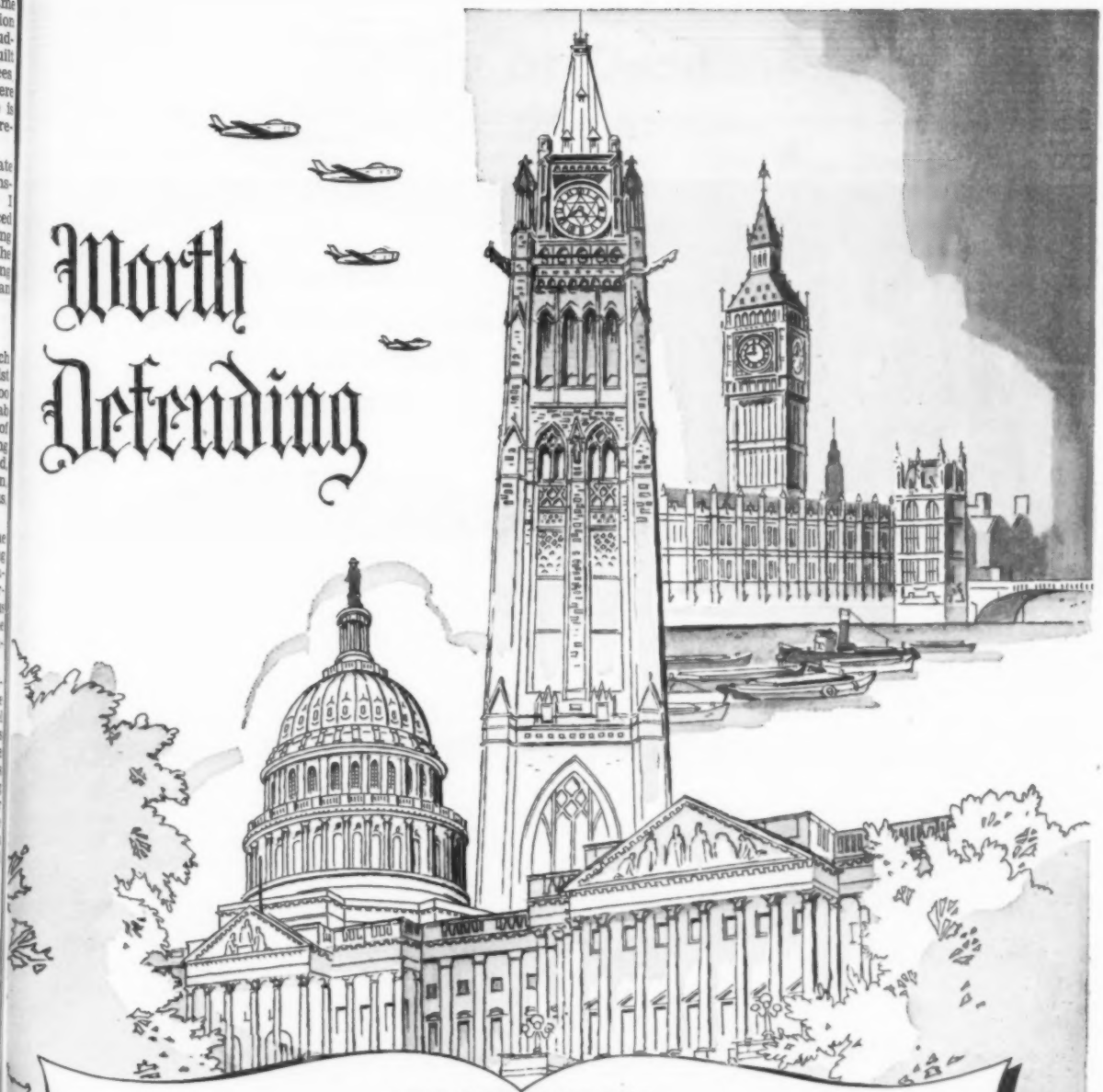
The Hotel du Caid is definitely the better of the two. The surrounding area, like most deserts, has a fascination in its changing colors and perspectives. It reminded me of various places in our own country minus the billboards, gas stations, and heavy highway traffic.

The town itself is strictly Arab, except for a few stores and shops in the center of town. To walk from the Hotel du Caid to the center of town, perhaps half a mile at most, you pass alongside open ditch sewers, in which the kids play, and the stench is about as strong as you can smell anywhere. It's better to take a taxi. Downtown there are camels, burros, cars, and trucks in as curious a mixture of traffic as you'll see on the globe.

Some of the Arabs in from the desert are tall, handsome characters with attractive features. Most of the women are veiled. There is a wide variety of costume and headgear. I stood for a long time at one main intersection watching the passing parade with intense interest.

THIS IS WHAT PART of Bou Saada looks like, but the two hotels not shown in this view are quite presentable and attractive and there are a few paved streets in the center of town.

Worth Defending



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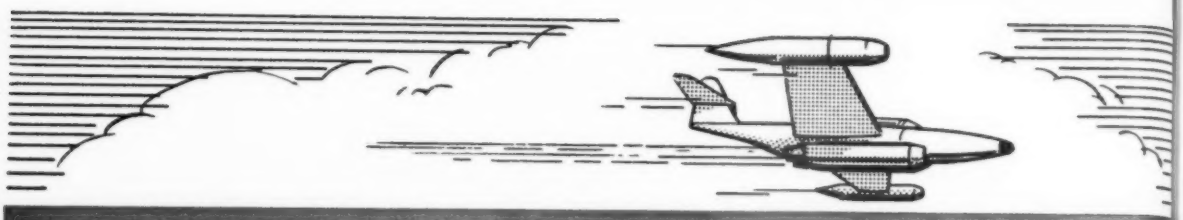

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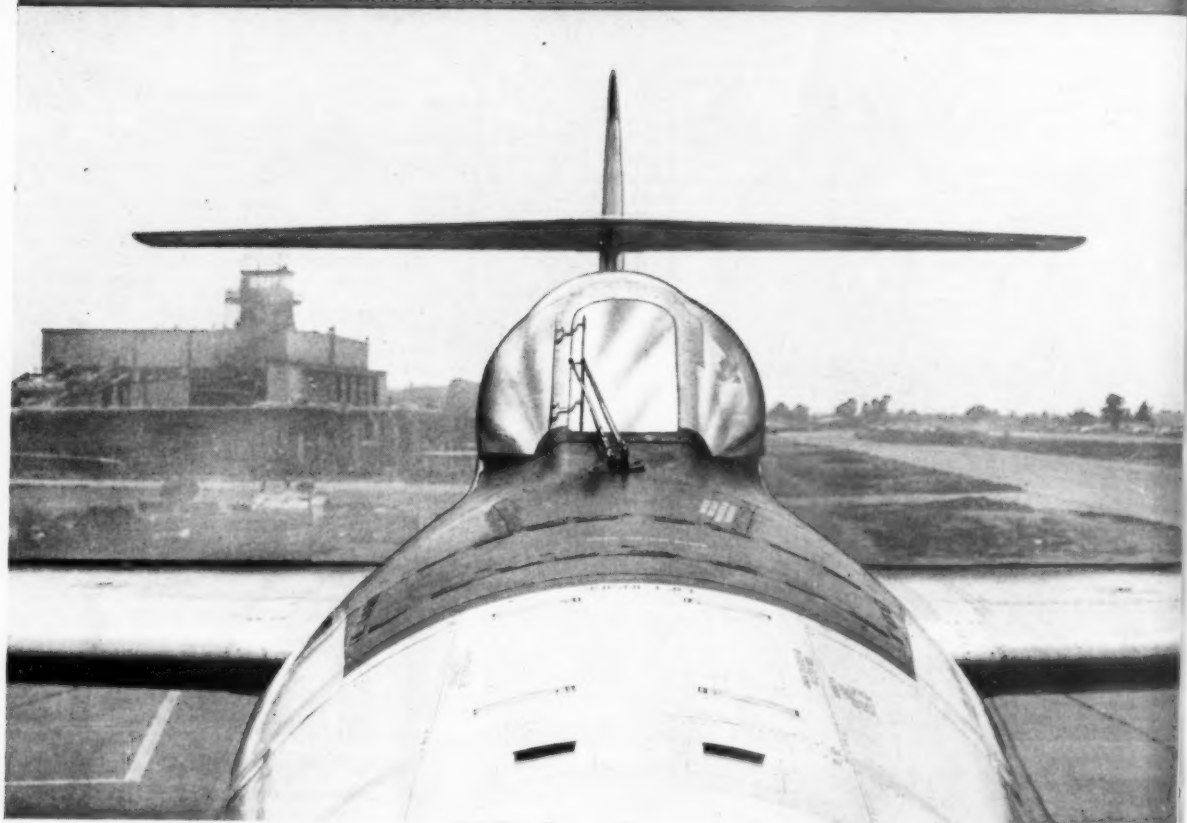

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News at Deadline

Hopkins Lists Eight Convair Projects

John Jay Hopkins, Consolidated Vultee board chairman, has listed eight projects currently under way at Convair's four plants.

Included are: (1) A study of water-based commercial transports; (2) A study of logistic transport cargo aircraft; (3) A successor to the Convair 340 commercial transport; (4) Development of a new Navy fighter soon to be announced (vertical take-off aircraft using turboprops); (5) Development of a supersonic long-range bomber (XB-58 Hustler); (6) Design and development of various Navy and AF missiles (including the Terrier); (7) Application of nuclear power to aircraft; and (8) Development of various electronic devices, including missile guidance systems, piloted aircraft guidance systems, and commercial electronic systems.

Hughes Aircraft's Functions Divided

A reorganization of the Hughes Aircraft Co., in effect splitting the functions of the electronic and guided missile producer, has taken place within the last two weeks.

The firm has now been divided into:

• **The Hughes Aircraft Co.,** a separate concern, whose profits will be used for the support of a foundation set up in Delaware last December, the Howard Hughes Medical Institute.

• **An aircraft division of the Hughes Tool Co.** This was the setup before Howard Hughes incorporated both Hughes Aircraft Co. and HHMI.

Under the reorganization, Howard Hughes becomes president of Hughes Aircraft Co. Directors will be Hughes, William C. Jordan, executive vice president, and Howard P. Hall, general counsel and vice president. On the company's executive committee will be Hughes, Nate Hall, Raymond B. Parkhurst, Robert J. Shank, and W. W. Wooldridge, all vice presidents.

The company's research and development laboratories were also divided into three major components: radar, headed by Shank; missiles, headed by Nate Hall; and laboratories (advanced electronics, microwave, and electron tubes). No manager has yet been selected for the third division. All will report to Jordan.

The aircraft division of Hughes Tool Co., it is understood, will deal principally with armament. Gen. Ira C. Eaker, vice president, and Jack R. Jerman, assistant general manager and director of services, have been assigned to Hughes Tool.

It is also reported that Noah Dietrich, Hughes' aide whose alleged intervention into the affairs of the aircraft company may have prompted the resignation of several top Hughes scientists several months ago, is considering retirement.

Senate Reports Out USAF Academy Bill

The Senate Armed Services Committee has favorably reported out with amendments the House-passed bill (H. R. 5337) to create an Air Force service academy.

The four amendments are (1) to require the USAF Secretary to accept the recommendation of a five-man commission appointed by him to choose a site for the academy, if its report is unanimous; if the report is not unanimous, the Secretary would have to choose a site from the first three recommended; (2) puts total cost at $126 million; (3) limits the special method of selecting cadets to four years; (4) guarantees the right of graduates to be commissioned in another service, with restrictions.

Lockheed Subsidiary Handles Japanese Deal

The Lockheed contract with the Kawasaki Aircraft Co., Ltd., licensing the Japanese firm to manufacture T-33 jet trainers and F-94 jet interceptors was signed with Lockheed Aircraft Service, Inc., instead of with the parent corporation.

Robert E. Gross, Lockheed president, said responsibility for the Japanese project was assigned to Lockheed Aircraft Service because the subsidiary has had long experience operating overseas bases to service U. S. military air forces. The Kawasaki arrangement includes maintenance facilities for Air Force planes in Japan and for future aircraft of Japanese security forces.

Lockheed Aircraft Service is also negotiating with the Allison division of General Motors for the manufacture and maintenance of jet engines by the Kawasaki aircraft unit in Kobe.

Kyes Resigns May 1

Roger M. Kyes, deputy defense secretary, has resigned. The resignation becomes effective May 1. He will be succeeded by Robert B. Anderson, who has been navy secretary since January 29, 1953. Anderson has had no direct connection with the aircraft industry except for his position with the Navy.

NAL Moves to Block EAL Bid on Colonial

A move to keep Eastern Air Lines from bidding on the assets of Colonial Airlines was made by National Air Lines just before press-time. NAL asked the CAB to restrain EAL from any "dealings or negotiations" with Colonial, and petitioned for an immediate decision on the NAL-CAI merger.

The latter merger case was heard simultaneously with the Eastern-Colonial case, but was left undecided by the CAB for "further consideration."

The NAL moves came within 48 hours of the time when sealed bids for the purchase of Colonial Airlines' assets were scheduled to be opened by the carrier in its New York offices at 3:30 p.m., March 10, with a decision to be made no later than March 17. Bids had been solicited from Eastern Air Lines and National Airlines.

It was a similar, though less restrictive, invitation by Colonial in 1952 that resulted in the Eastern-Colonial agreement which President Eisenhower disapproved recently. Two years ago Colonial asked 10 airlines to bid for its assets.

In a company announcement Colonial said it believes its route structure is such that it cannot operate profitably without a large subsidy from the government, and it therefore feels a merger into a non-subsidy carrier is in the public interest.

Sample contracts submitted to Eastern and National to be filled in by those carriers contained a warranty clause in which the "purchaser represents and warrants that it does not, in violation of . . . the Act, control or have the power to control in any way whatsoever directly or indirectly Colonial, and that until the government approval dates . . . it will take no action so to control or to acquire the power to control Colonial."

The clause provides for a penalty of $2,000 per day, payable to Colonial, if a merger deal is defeated because of such control factors.

Colombia Buys Six Lockheed T-33's

Colombian air officials have ordered six Lockheed T-33 trainers from the Air Force for $1,162,000, in the first transaction in which a Latin American nation has purchased U. S. jet aircraft.

The move is believed to be indicative of a trend toward an important South American market for modern American aircraft over those being produced in Europe, a high official said.

Col. Hector Materon, Colombian air attache, states that his country has no firm plans for buying more jets at the moment but indicated it is seriously considering obtaining some North American F-86F's or Republic F-84F's in the future following work with the Lockheed trainers.

The six T-33's will probably be delivered to Colombia within 90 days, he said, and will come off the production line at Lockheed Aircraft Corp., Burbank, Calif. The payment represents the actual cost of the planes plus a year's supply of spare parts, and the transaction was accomplished under the Bilateral Military Assistance Agreement for Western Hemisphere defense.

House Passes Bill Including CAB Subsidy

The State-Justice-Commerce appropriations bill for fiscal 1955, as passed in the House and sent to the Senate, carries in it a CAB item of $40 million for airline subsidies.

The subsidy sum approved was an increase of $17 million from an original committee recommendation for only $23 million.

The $40 million the House would allow CAB for subsidy payments in the 12 months beginning next July 1 is estimated to be sufficient for the Board's operations through March 1, 1955, at which time a deficiency appropriation would be required for the balance of the year.

3 Local Lines In New 1st Class Mail Test

The Post Office Department is scheduled to start shipping first class mail via North Central Airlines, Central Airlines, and Frontier Airlines, in an experiment extending to December 31, 1954.

Effective date was set tentatively as March 10; payment will be 30¢ per ton-mile. It is believed that other local service lines will be included later.

In addition to letter mail, the three airlines will haul preferential mail (special handling and special delivery parcel post) and newspapers.

Brazilian Airline Orders Super Connies

Influence of the United States in the transport market in Brazil is seen steadily increasing. As this issue went to press it was learned that Panair do Brasil is planning to order a fleet of Lockheed Super Constellations as alternate equipment for its forthcoming Comet II's.

VARIG ordered Super Constellations last year, and REAL has ordered two Convair 340's, in addition to six already on order. Other Brazilian carriers and that nation's airforce are also reported planning to order Convairs.

P&W Cuts Production of Piston Engine Parts

Two hundred of Pratt & Whitney Aircraft's 35,000 employees went off the payroll March 5 in a layoff prompted, the United Aircraft Corp. division said, by reduction of piston engine part production at the Southington, Conn., plant.

Arrangements are under way to transfer part of the production of J57 fuel manifolds from the East Hartford, Conn., plant to Southington (where 35,000 are now employed) but the move, probably to be effected in the next three weeks, is not expected to bring up the employment level.

"Adjustments must be made in fitting a peak total of employment reached during the post-Korean period with the new manufacturing program," William P. Gwinn, P&W general manager, explained. He said, "We expect to continue production of our piston engines, especially of our R-2800 Double Wasp, for a long time. Meanwhile we are making the transition to high-quantity jet production, especially on our J57 engine."

Crash Injury Research Joins Guggenheim Group

Two aircraft safety research groups operated by Cornell University have been united in an organizational realignment. The aviation section of Crash Injury Research, previously under the direction of the Cornell Medical College, will become a division of the Cornell-Guggenheim Aviation Safety Center, headed by Jerome Lederer.

More space is to be available for the aviation crash injury group, which will be headed by A. Howard Hasbrook. The founder of CIR and director during its 12-year history, Hugh de Haven, will continue to be in charge of the section investigating automotive safety. This group will remain a part of the Medical College.

Wakefield to NWA Board

Lyman E. Wakefield, Jr., Minneapolis banker and civic leader, has been elected a member of the board of directors of Northwest Airlines, filling a vacancy that had existed since the death last summer of William Tudor Gardiner.

Canadair Gets Contract For 100 Sabre 5's

Canadair Ltd. has received a new $24 million contract for 100 Sabre Mark 5 fighters with Avro-Canada Orenda engines. This will extend the present Sabre line but will not result in an increase in the Montreal company's labor force.

The planes involved in the new contract reportedly may be armed with rockets and air-to-air missiles. The Canadian government's present policy is to re-equip the RCAF's day fighter squadrons with Sabre 5's and turn over the earlier J47-powered Sabres to NATO forces.

Engineers Authorize Crossing of Lines

Production workers at Sperry Gyroscope Co.'s plant at Lake Success, N. Y., returned to their jobs on March 8 after a striking engineers' union decided not to demand that other unions respect its picket lines. The strike began March 2.

About 16,000 members of the IUE-CIO went back to work but 2300 members of the Engineers Association, an affiliate of the independent Engineers and Scientists of America, remained out to back up demands for a 15% wage boost.

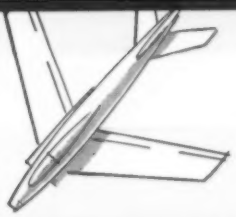
NBAA Supports CAA Stand on DME

The National Business Aircraft Association has come out in support of CAA's decision to go ahead with DME installations in the common system of navigation, in opposition to the Air Transport Association's stand.

In a letter addressed to CAA Administrator Fred B. Lee, Cole H. Morrow, chairman of the board of directors of NBAA, stated: "ATA is the representative of *one* of the users of the air space, but is not *the* representative, and we do not think they should take the liberty of trying to speak for other segments of the industry, particularly when we are not in agreement with their position.

"We feel," Morrow continued, "there is a definite and urgent operational need at this time for DME . . . We are encouraged that you are going ahead so that we can begin immediately to derive some benefit from the expenditures already made."

FIRST IN FUEL METERING



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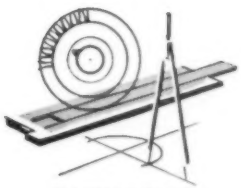
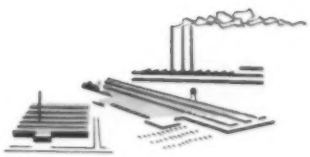


ENGINEERING



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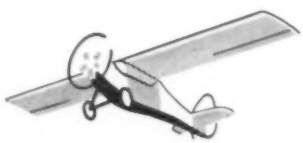
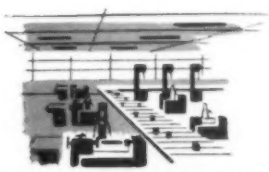


PREVIOUS ACCOMPLISHMENTS



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